

THE
COTTON AND COMMERCE

INDIA,

CONSIDERED IN RELATION TO

THE INTERESTS OF GREAT BRITAIN

WITH

REMARKS ON RAILWAY COMMUNICATION

IN THE BOMBAY PRESIDENCY.

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PREFACE.

A FEW sentences may introduce the subjects of the following sheets to readers who are not immediately connected with India, or with the import and manufacture of cotton. This fibre, which has since become so important in the industry and commerce of the world, seems first to have been employed in England as the material of woven fabrics near the end of the sixteenth century: from that time to the days of Wyatt, Arkwright, and other inventors of spinning machinery, (a period of 150 years,) the means of manufacture were of the simplest description, and of domestic use; the supply of the material was chiefly from the Levant, and in the later part of the period from the West Indies. These inventions began to appear about the year 1740, the most remarkable date of their subsequent extension and elaboration being that of Arkwright's first patent, 1769, in which year also Watt's first patent for his celebrated improvements in steam engines was obtained. During this period of unprecedented activity in invention in England, our countrymen were engaged in struggles in Madras and Bengal, of which the principal event, but neither the earliest nor latest, was the battle of Plassey, in 1757. The issue of these struggles gave to Britain an undoubted supremacy in both those parts of India, and afforded facilities to greatly-increased exports of the cotton manufactures of that country to England, nearly about the time when mechanical inventions at home began to enlarge the supply of similar articles made of the cotton derived from other countries. From these causes arose an extended and rapidly-increasing demand for cotton fabrics; the strainness of the supply of the raw material began to be felt as one of the

PREFACE.

chief commercial inconveniences of the day. The East India Company attempted in vain to procure larger quantities from the limited portion of India then governed by them, as well as from Guzerat, at that time under native rule, and perhaps from other quarters where they had established commercial factories. The supply remained, however, inconsiderable, and the quality of so much as they did procure, taken in comparison with that of cotton from other quarters, did not obtain for it such prices as encouraged the extension of the shipments. In 1793, America began, most unexpectedly to England, to furnish a suitable article; and from a period quickly following that date to the present, that country has been the principal, and in some practical senses almost the sole, source of supply.

India, however, has also increased her exports to us, but not at such a rate as either to meet our necessities, or to prevent our wonder that a country in which probably cotton was first known and manufactured, and which is most peculiarly under our own influence, has not been made effectually to answer our requirements in a matter in which it would be so much to the interest of India itself to meet them. This paucity of supply from our great Oriental Empire, long a phenomenon and a reproach, has latterly become, through the falling off in the American supply, a pressing evil; its causes and remedy, respecting which many opinions are held, are in part the subjects hereinafter discussed.

It should perhaps be explained that there are many kinds, or rather qualities, of cotton. This fibre is the fruit of plants of different forms and magnitudes, from an annual creeper to a tree twenty feet in height. Only the kinds produced by annual, triennial, and perennial bushes, are used for woven manufactures; and even these vary much with the seed, the climate, the soil, the cultivation, and perhaps with circumstances which are yet but very obscurely, if at all, traced from their effects. The kind commonly, and perhaps from ancient times, produced and used in India, differs from the sorts obtained from other countries, and seems, even from the days of Ark-

wright, ~~to have~~ been held here in inferior estimation, although its substantial good qualities give it a decided preference with the natives who use it. Much of the discussion and effort which have been expended on the supply of cotton from India, have been directed to the establishment in that country of the growth of the more approved varieties; these are probably of Mexican and West Indian origin, and from further peculiarities, acquired from cultivation or locality, are now known as Sea Island, Bourbon, Pernambuco, New Orleans, &c. It is not impossible, however, that improved treatment of the native produce of India, as to cultivation and cleanness, may afford an article combining, in some measure, the good qualities of the Oriental and Western cottons.

Not only the supply of cotton, but our general commerce with India, has, by its limited extent, excited the attention and the solicitude of our mercantile and manufacturing interests, and of the Government itself. To this subject a portion of the following pages is devoted.

The practical and somewhat technical chapters which relate to railways in Bombay, discuss subjects which seem to derive importance from their direct connection with measures deemed necessary alike to the augmentation of our own commerce and to the welfare of India. If in these chapters some matters of a local character are found by the general reader to be little calculated to amuse or interest him, others are necessarily intermingled with them which involve the exposition and use of general principles, whose truth or error may be of grave consideration both in this inquiry and elsewhere.

Credit is asked for good faith, and for such accuracy as caution could afford, in the reduction of Indian weights, measures, and moneys, in their extraordinary and unclassable diversity, from native to English denominations. Indian facts commonly lose the weight they would have on the public mind of England, for want of this kind of translation; and when it is known that "seers" exist in not distant parts of India from less than one pound avoirdupois to more than two "maunds"—

from 25 lbs. to more than 100—and “candies” from 500 lbs. to more than 3000,—that the ~~same~~ names are often used for weights and measures, but to different relative effect, in different places—that towns within a few miles of each other have standards differing by 10 or 20 per cent., and sometimes even different entire systems,—and that money of the same name in different local coinages varies 15 or 18 per cent. in value, it will be admitted that no true idea of Indian facts can be obtained until this diversity has been made to disappear by inquiries and calculations, however laborious, or however exposed in instances to risk of error. To have given not only the English results, but the original Indian statements, would have increased the bulk of the book to little other effect than that of obscuring its arguments. The authorities everywhere quoted will lead those who may take so much pains in the inquiry to each statement in its primitive form. It is necessary to add that the Company’s rupee has been taken in these calculations at 23*d.*, and the Hyderabad rupee at 19½*d.*

Among the papers in the Appendix will be found a reprint of a Report by R. Stephenson, Esq., M.P., dated 20th January, 1847, and of some remarks in the nature of a summary by myself. On the insertion of these, published as they were so long ago, no remark seems necessary. But following them are two other papers which have not before been printed, and which form part of the proceedings of the Great Indian Peninsula Railway Company: one of these is a letter by myself to the eminent engineer just named; the other is a report by G. T. Clark, Esq., C.E., on the engineering features of the Concan and the ghauts. Since these papers contain nothing but physical facts, of the most public nature, necessary to the description and defence of the line I proposed, I conceive that the publication of ~~them~~ is no great violation of propriety; and, for perspicuity and authentication, I prefer giving them in their original shape to evading this slight formal impropriety, if it be one, by the easy device of making other use of their substance.

The course of argument prescribed by the circumstances of

the case has excluded the notice which would have been due to other labourers in the field of Indian improvements, and particularly of Indian railways, had a more extensive discussion of those subjects been professed. My feeble tribute would be an addition of very slight importance to their honour; but, however slight, it would have been a gratification to me to render it, had I felt myself sufficiently informed, and moreover entitled, to enter on a public examination of the varied and extensive subjects in connection with which that honour has been earned. The consideration of general principles, into which the facts of the case with which I have been so intimately connected have led me, may indeed seem to have an application beyond the immediate occasion of it; but I trust it will be received as an exposition of views which I am desirous of submitting to public examination, on account of the importance of their consequences if they be true, and not in any degree as an expression of hostility to the measures which others have thought it their duty to adopt.

The nature of the subjects discussed, and the scantiness of available exact information of some important kinds, have rendered it necessary to be content, in some cases, with arguments less precise and demonstrative than may be desired. I trust, however, that probability enough has been attained to serve as a present guide to safe practical measures, and that at least a service has been done by putting into form for further investigation by the aid of better ascertained facts, some arguments which may throw light on the condition of India, and the means of its amelioration. It may be hoped that the mission of inquiry which has just been entrusted by the Chamber of Commerce of Manchester to Mr. Mackay, will contribute to those further investigations which must be required no less by our growing concern with India than by our present interests.

A task at once grateful and perplexing now devolves on me; grateful from the value and cordiality of the aid given me in my investigations,—perplexing from the extent and variety of the sources from which that aid was derived. One circum-

stance gives me especial pleasure; it is that I have to acknowledge assistance almost equally from gentlemen on all sides of Indian politics. To some extent this pleasing duty is abridged by the free quotation of authorities in the work itself; but there are some obligations still requiring discharge. For the first turning of my attention to Indian affairs I am indebted to Geo. Thompson, Esq., M.P. To Major-General Briggs I owe the first encouragement I received to persevere in those efforts which eventuated in the formation of the Great Indian Peninsula Railway Company; and besides his cordial support of that undertaking at its formation, and during its hazardous infancy, he has ever afforded me that ample and essential information as to facts which a long and active service in high political stations in the East, combined with extensive Oriental scholarship and great powers of observation, have placed so much at his command.

From Major Oliphant, ever since my first resort to the India House, and also from Lieut.-Col. Sykes, from nearly the same early date, I received that countenance and aid which their connection with and intimate knowledge of Central Peninsula and Western India especially induced them to afford: to other directors of the East India Company I am indebted for other encouragement and counsel, although the facts which were more particularly concerned did not lie within the compass of their personal experience.

The permission originally given me by the Court of Directors to avail myself of their papers and records, placed my search in their house under the inspection of T. L. Peacock, Esq., the Examiner of Indian Correspondence, from whom, and from gentlemen in his department, as well as from J. Walker, Esq., the Geographer of the East India Company, and Dr. J. F. Royle, in charge of their correspondence relating to the vegetable productions of India, I have always derived the most important aid, given with liberality and cheerfulness. I should acknowledge with equal pleasure, as with equal reason, the courtesies received from the Secretary, J. C. Melvil, Esq.,

and his department, and also in the office of the Board of Control, during the protracted term which preceded the grant and final settlement of the guarantee, if my present purpose, in respect of the Government and its officers, had not particular reference to measures for the investigation and use of facts.

In England, also, the long experience of Mr. Williamson Ramsey in Indian revenue administration, and the intimate knowledge consequent upon it of the state of the people, and of the fiscal arrangements which have been believed to affect it, have been kindly and freely made available for my information; and I have had the like assistance from Col. Dickinson, late Chief Engineer in Bombay, for physical and professional particulars.

My obligations in India are past enumeration, and they are too much blended with the prosecution of the designs of the Great Indian Peninsula Railway Company to permit that separate acknowledgment on my own account which is due from me, and which I should have preferred; and while I ever held to that independent course of action to which my views on the position of Governments in relation to industrial enterprise necessarily led me, I have still to repeat what I have said elsewhere, that I never made an inquiry or needed help which did not meet, in official quarters, with the readiest and most effectual response. The successive Governors of Bombay, the Right Hon. Sir George Arthur, Bart., K.C.H., and the Hon. R. L. Reid; the Commander-in-Chief, Lieut.-Gen. Sir Thomas M'Mahon, Bart., K.C.B.; the Members of Council, J. H. Crawford, J. P. Willoughby, and D. A. Blane, Esqrs.; and the Superintendent of the Indian Navy, the late Sir Robert Oliver, repeatedly took active measures to facilitate my operations and promote my objects; as also did the several Secretaries to Government, the Collector of Customs, and Reporter-General H. H. Glass, Esq.; the Quartermaster-General of the Bombay Army, Col. Neil Campbell; the Chief Engineer, Col. Jarvis; and Alexander Elphinston, Esq., then Collector of Poonah.

If, however, I limit personal mention to these gentlemen, alike eminent in office and earnest in their aid, I trust it will not be supposed that I have forgotten the assistance given with equal cordiality by others whose marks will be found all over the proceedings.

That the members of the Provisional Committee in Bombay, of the Great Indian Peninsula Railway Company, both European and native, should promote my inquiries, if to be expected, is not less to be remembered. Every assistance they could give testified the interest they individually felt in the object. Confining specific notice necessarily to a few, I must first mention J. P. Willoughby, Esq., who, until his elevation to the Council, was the chairman of the Board in Bombay, and who ever employed his influence to obtain for me the most certain information. R. W. Crawford, Esq., who succeeded to the chair, not only promoted my own inquiries in India, and has continued to encourage me by unfailing kindness throughout, but by his efforts, in connection with the Committee appointed in 1846, by the Government of Bombay, to inquire into the state of the cotton trade, he contributed greatly towards securing for public use that large and important collection of authentic statements, which forms the Report of that Committee, and which has done so much to prepare for a right appreciation of the subject by the manufacturers of Great Britain. Nor can I forbear to remark the constant and tried support he gave to an enterprise he deemed so important to the commercial welfare of India, from the time of his arrival in England to a period when its original difficulties seemed to be overcome. To J. Smith, Esq., the Deputy Chairman of the Provisional Committee in Bombay, I was indebted for every assistance which public spirit or private friendship could suggest; and whether in the jungle or the city, in the ordinary business of the Board, or the details of inquiry which devolved on myself, I could always rely on his kindest aid. A production of this gentleman, issued some time ago, under the title of "Railways for Bombay," did, perhaps, more than any other like

effort to impress on the public mind of India the importance of those great works. Nor is it too much to say, that without the steadfast adherence of the two last-mentioned gentlemen to the designs and interests of the Great Indian Peninsula Railway Company, in the darkest and most discouraging days, there is great probability that the prospect of establishing railways in the Presidency of Bombay would have been definitively abandoned. I ought not to omit, that the Indian investigations were benefited by the interest taken in them, and the arrangements made to facilitate some of them, by A. S. Ayrton, Esq., lately the Solicitor of the Company in Bombay.

The facts contained in the succeeding pages will be found to bear testimony to the great and skilful efforts made by Geo. T. Clark, Esq., and H. Conybeare, Esq., the two engineers with whom I had the pleasure to co-operate. Praise of mine would represent with very little sufficiency the value of unusual exertions, made in some of the most difficult parts of India, in a year when drought and cholera added their terrors to the task, and without which some of the most important questions would have been left in a dangerous, if not fatal, obscurity; but I am bound to say how much the collection of facts on which my arguments are founded is indebted to their care and assiduity.

This notice of the aid afforded me in India must include that of the native civil officers of all ranks with whom I came in contact. Whatever was the zeal or kindness of my own countrymen, it found a congenial answer in the conduct of every native in office with whom I had to deal. The incidents of my brief sojourn in their country have left in my mind a strong interest in the welfare of a people who, although long accustomed to violence and violent changes, seem remarkably accessible to the influence of kindness, and who, with all their faults, are ever ready to repay justice with confidence.

To the merchants and manufacturers of Manchester and its neighbourhood, I naturally looked for information; and it was most willingly afforded me from many quarters. In particular, J. Bright, Esq., M.P. for that city, always encouraged my

PREFACE.

efforts on a subject in respect of which he has taken so much pains in many ways ; and the presidents of the two commercial bodies, T. Bazley, Esq., and J. A. Turner, Esq., with the respective secretaries, T. Boothman and H. Fleming, Esqrs., and other members, assisted materially, both by direct information and by their influence, to obtain for my use the facts which I needed, and to draw public attention to those which I alleged.

The extended acknowledgments, in respect of *facts*, which I have thus felt it my duty, as well as it has been my gratification, to make, impose on me the further obligation of obviating the possibility of my *opinions* being wrongfully imputed to others. From the friends whose advice I should have most gladly sought, I have systematically withheld all knowledge of the contents of this book, (except in one trifling instance for the correction of a statement,) in order that some sentiments which I apprehend may not at first be generally approved, should be attributed, as they ought to be, to myself alone. I trust, however, that the opportunities so extensively and willingly afforded me have not been altogether neglected or misused ; and one of my most earnest wishes is, that the investigations they have induced, and the conclusions to which they have led me, may contribute, in some humble degree, to the welfare of India and of England.

London, Jan. 1, 1851.

CONTENTS.

CHAPTER I.

ON THE PRESENT STATE OF THE SUPPLY OF COTTON FROM INDIA AND OF THE QUESTIONS CONNECTED WITH IT.

	Page
Magnitude of the Cotton Manufacture	1
Scantiness of the supply of cotton	2
Quality and suitableness of Indian cotton	3
Proportion of the supply from India	5
Efforts of the Government and suggestions from other quarters for extending the supply from India	5
Proposed cultivation of American cotton in India	6
Choice of soil	7
Irrigation and hygrometry	9
Improved agriculture	10
What is the vital function of the cotton fibre in the plant itself? . . . note,	10
Improved modes of cleaning	11
Law against adulteration	12
European supervision of the agriculture of cotton	13
European commercial agency in the interior	14
Land tenure	17
Local native demand for cotton	17
Land-tax not the limit	18
Land-tax, however, not without effect	20
The land revenue of India not rent, but tax	23
Rent cannot limit the production of cotton in India for a long period to come	24

CHAPTER II.

THE PRODUCTION AND PRICES OF COTTON IN INDIA.

The course of the argument to be pursued	27
Are all parts of India equally adapted to the growth of cotton?	28

CONTENTS.

	Page
Proportion of the supply derived from different parts of India	28
The cotton of Bengal	29
The muslins and cotton of Dacca and Chunderee	note, 31
The cotton of Bundelcund and the North-West Provinces	31
———— Malwa	34
———— Rajpootana and Marwar	34
———— Orissa	35
———— the Madras Presidency in general	36
———— the Northern Circars	37
———— the coast country south of Madras	38
———— Travancore, Malabar, and Canara	39
———— the Concan	39
———— Mysore	40
———— Cutch and Scinde	40
In what sense the countries about to be described are superior	41
The supply of cotton from Coimbatore and Tinnevely	42
———— ——— Guzerat	45
Proportion of the supply from different parts of India to Bombay	46
———— ——— to Bombay from Peninsular India through the different ports of the Concan	47
The road from Bellary to Sirsee, and the traffic of the port of Coomptah . note,	47
Supply of cotton in past times, with its cost, from Central Peninsular India to —	
Bengal	48
The Northern Circars	49
Mysore	50
The westward	50
Boundaries of the country affording the above-mentioned supply—	
East and west	51
North	52
South	54
Places within that country which have afforded acceptable cotton	55
Estimated capability of that country for supplying cotton	57
Local prices of cotton	58
Effect of improved arrangements and profitable employment	59

CHAPTER III.

CAUSES OF THE INCREASE OF THE EXPORT OF COTTON FROM INDIA TO ENGLAND UP TO A CERTAIN PERIOD, AND OF THE CESSATION OF INCREASE, FROM THAT TIME.

The argument rests of necessity on a comparison of prices	60
No future changes in India likely to invalidate the conclusion	61
The importance of other improvements not denied	62
History of the supply of cotton from India to England	63

· xvii ·

CHAPTER IV.

Inducement to extend and improve the cultivation	87
Similarity of effect to that in America	88
Effect on European and native agency in the interior	89
——— native money-lending	91
——— the motives to improvement	93
——— village artizanship	94
(The village system of India)	note, 94
——— on cultivation and irrigation	96
Decay of ancient works of irrigation	note, 97
Probability of improvement shown by garden cultivation	99

	Page ⁿ
Hindoo implements need improvement as well as English	100
Why is India poor?	101
Taxation and economics of the time of Akber	note, 101
Why is the small taxation of India so burdensome?	103
Wastefulness of all processes	107
Waste of time	110
Hoarding	110
War and violence	111
Famines	112
Famine at Delhi	note, 113
Increase of fertility does not prevent famine	114
Famine at Poonah	note, 114
Taxation	115
——— compared with that of England	115
Principles influencing the amount of taxation	116
The peace is kept in India	117
Taxation not the greatest evil of India	118
Indapoor	note, 118
The taxation of the chief Cotton Countries is not under our control	119
Allegations of misgovernment not generally supported	122
Native arbitrary taxation beyond the land-tax	note, 122
Difficulty of reforming India on European principles	122
Weakness of public opinion in England on Indian subjects	125
——— and of all public opinion, good in our sense, in India	126
Importance of extended intercourse with India	127
Education	128
Capabilities of the Natives of India	129
Our moral influence in India	130

CHAPTER V.

“THE GENERAL COMMERCE OF GREAT BRITAIN WITH INDIA.”

Its importance	131
South America affords a fair comparison in climate and races	132
——— government, public security, and	
taxation	134
——— commercial legislation	134
——— capability of supplying returns, and	
cost of freight	135
——— the effects of religion or caste	136
Tables of comparative population, commerce, taxation, and exports of India and South America	137

	Page
Disparity of our exports to India	139
Diversity of our exports to different parts of South America	140
Roads and commerce of Mexico	141
———— Central America	144
———— Hayti	147
———— Cuba and the Foreign West Indies	148
———— New Grenada	151
———— Venezuela	152
———— Ecuador	152
———— all Columbia	154
———— Peru and Bolivia	154
———— Brazil	160
———— Chili	161
———— the States of Rio de la Plata	162
———— all South America	164
Classification of results	164
Internal commerce of Bombay	164
Effect of conversion of value in a heavy into that in a lighter material	166
Grain not always the most saleable article	167
Connection of roads with imports	168
Internal commerce of Madras and Calcutta	169
Comparative British imports of all India	171
Feebleness of Indian export	172
Effect of raising our export to India to the scale of that to South America	173
Necessity of extension of markets	173
Eligibility and accessibility of India for such extension	174
Colonization	174
Proposed theory of commercial panics	175
Necessity of penetrating the interiors of large countries	177
Special value of India as a market	178
Importance to us of the means of internal transit in foreign countries	179
Authorities and remarks to the tables in the chapter	180

CHAPTER VI.

DISCUSSION OF CERTAIN FACTS AND PRINCIPLES INVOLVED IN THE LINE, AND PROCEEDINGS OF THE GREAT INDIAN PENINSULA RAILWAY COMPANY.

State of knowledge and opinion on Indian Railway subjects	184
Early efforts	185
—— investigations	186
—— differences of opinion	187

	Page
The book of Lieut.-Col. Grant	188
Points of agreement with that author	189
Misapprehensions of facts by Col. Grant, as to estimated cost of line	189
terminus	190
charge for carriage	191
traffic of the ghauts	192
sources of supply of cotton	193
Effect of Malsej line on the trade of Berar	194
Difference of the cases of Berar and Guzerat	195
Sea-carriage from Guzerat	195
Over-taxation of Guzerat	196
Historical notices of Guzerat	note, 197
Cheapness of cotton in Berar	199
rendered useless by cost of carriage	199
Courses of the several proposed lines	200
Sea passage	201
Cost of land in Bombay Island, and crossing of streets of the town	201
The preference for the Bhoze Ghaut line depends on the supposed interests and importance of Poonah	202
Is a large town always essential and sufficient for a terminus?	203
History and present state of Poonah	203
Poonah not essential and sufficient for a terminus	206
— may be better served by another plan	206
Importance of the North and South line	208
What is done now is not final and exclusive	210
Military convenience	211
Position, duties, and safety of the English in India	212
True basis of the British power in India	212
Increasing dissatisfaction with improving condition	214
Chief advantage of railways to the Government	214
depends on commercial success	215
and must not be sacrificed to military convenience	215
Military convenience promoted by commercial lines	215
Necessity of economical construction	217
Non-necessity of "experimental" lines	218
"Comprehensive" views and efforts, and subsequent contraction of plans	218
Monopoly	220
Creation of traffic, English examples	221
Indian increase of traffic likely to be greater than English	224
and to afford much additional employment	225
but perhaps of a different kind	226
Fear of improvements very general, and sometimes leads to violence	227
Neither roads nor brinjaries will be superseded	228
No legal monopoly ever proposed	229
A practical universal preference no monopoly	229

	Page
Allegation of monopoly is opposition to improvement	230
The interest of the Railway Company dictates low charges	230
Freedom the true remedy for monopoly	231
Monopoly in the sense of patent right	232

CHAPTER VII.

ENGINEERING CONSIDERATIONS AFFECTING THE LINES BY THE
*THUL, AND MALSEJ GHAUTS RESPECTIVELY.

Disadvantages of the harbour crossing	234
———— break at the ghaut	235
A ghaut which can be passed by railway essential to the first plans	237
Description of the Ghaut Country	237
History of the search for a line	239
State of the evidence as to the different lines	245

Bhore Ghaut Line.

Local features of the Bhore Ghaut	246
Doubts as to the ascent of it	247
Line beyond the ghaut and beyond Poonah	247

Thul Ghaut Line.

Wildness and rapid rise in the east of the Northern Concan	249
Ghaut ascent, and line to the eastward	250

Malsej Ghaut Line.

Terminus at Bombay; works up to Callian	251
Works in the Concan	251
The ghaut ascent—that first surveyed	252
———— that afterwards surveyed	253
Works to the eastward of the ghaut	254
Engineering character of the line	255
Estimated cost of construction	255

Discussion of objections.

Height of the ghauts	256
———— highest points on the two lines	257
Advantage of concentration of the ascent	258
Variations of opinion on the possibility of passing the ghauts by railway	259
Tunnels—ventilation	259
Native tunnels	note, 260
Cost, mistaken application of the principle of average	261

CONTENTS.

	• Page •
English tunnels	261
Due reduction of Col. Grant's estimate	263
Indian facts	263
Tunnel at Sattara	265
Little probability of avoiding tunnels or works of equal cost elsewhere	266
The Malsej ascent is in the direction required by the road	268
The proposed viaduct railway more costly than an ordinary one	268
----- liable to damage in case of popular discontent	271
Summary	271

CHAPTER VIII.

THE PROFITS, CONSEQUENCES, AND PUBLIC CONVENIENCE OF THE CONTRASTED LINES.

Application of English capital to Indian works ; its importance	273
----- discouraged by discontinuity of lines and novel plans	274
Separation of traffic disadvantageous to shareholders	275
----- public interests	276
----- the extension of the Indian Railway system	277
<i>The line by Poonah.</i>	
Its circuitousness	278
Intended, in consequence, in 1836 to be superseded by a mail-road, via the Malsej	279
This circuitousness not necessary to the general accommodation of the country	280
The line in relation to the Gunguthurree and Candeish	281
----- country east and south-east of Poonah	282
----- Nizam's country	282
----- Berar and Calcutta	283
On crossing native territory	283
<i>Common road or tramway by the Thul Ghaut.</i>	
Prime cost of common cart-carriage	285
Demand, not prime cost, governs price	286
Price of native carriage	286
Inapplicability of an example from Allâhabad	286
Carriage not better managed by a Company	287
Cost of draught on a tramway	288
Amount of draught depends on the quality of the carriage as well as of the road	288

	Page
Effect of ascents .	289
Cost of works of continuity and level compared with those of roadway ^{superstructure}	289
Cost of draught on ordinary roads	290
For a large traffic a level road had better be made a railroad	291
Application to the Thul Ghaut line	291
Cost of <i>English and Indian steam-draught</i>	293
Steam draught cheaper than cattle-draught, both being in India	295
Considerations deciding the choice of common or railroads	note, 296
Insufficiency of common roads for trunk lines in India	297
Summary of conclusions affecting the Thul Ghaut line	298

The line by the Malsej Ghaut.

Population and condition of the country traversed by it :—	
————— Bombay, Salsette, and the Concan	298
————— the Jooneer districts	300
————— the country north of Alleh, the Gunguthurree, and Candesh	302
————— Sholapoor	303
That line the best which will carry most goods	304
Quantity of cotton, grain, and salt	305
Traffic for Europeans, and military stations	note, 305
Inconsistencies	306

Traffic estimates for the Malsej Line :—

Sources of the earliest information	307.
All the traffic does not go by the Bhere and Thul Ghauts	307
Inutility of the accounts of the late transit duties	309
Correspondence with British officers in the interior	310
Difficulty of forming conclusions	310
Attempt to investigate the trade in grain	311
The traffic to enter on the railway	312
The amount of grain to be carried	313
The traffic to pass the ghauts	314
The Panwell trade	315
The traffic in salt—the investigation of it—its courses and amount	316
Total amount of traffic	318
Neither passengers nor increase of goods traffic taken into account	318
Charge for carriage	319
Probable future charge	319
Improbability of lower charges for bullock and cart-carriage	320
Sufficiency of estimates	321

CHAPTER IX.

ARRANGEMENTS FOR THE PROSECUTION OF INDIAN PUBLIC WORKS, AND OF THE GREAT INDIAN PENINSULA RAILWAY IN PARTICULAR—INTEREST OF DIFFERENT CLASSES IN THE SUBJECT.

	Page
Correctness and sufficiency of foregoing arguments and statements assumed	323
Circumstances accrediting the result	324
<i>Inquiry into the causes of delay and the consequences of existing arrangements.</i>	
The guarantee	325
———— rendered the intrinsic prospects of the line inoperative	325
———— departs from established principles of legislation on Indian affairs	325
———— brings in the disadvantages of Government management	328
Characteristics of Government management	329
Rigidity of control	330
Over-occupation of the chiefs	331
Absence of special aptitude	332
Impairing of impartiality	333
Exposure to changes from extraneous causes	334
Evils of a "separate department" for an extra-political object	334
Repeated recurrence to the same failing device	335
Characteristics of private enterprise	335
Instances of failure in Government agency	336
State of the question as to roads, tanks, &c., in India	337
Unavoidable waste of zeal	338
The roads of England and France	339
State of public departments in England approaching in nature to private business	340
Comparison of the position and conduct of the Governments of British India and of the United States	341
Neglect of roads charged erroneously on the Government of British India	343
Its alleged proprietorship of the land does not imply that the Government should make roads	note, 344
Injurious effects of Government charging itself with the roads	345
The alleged jealousy of the Government	346
Wars, and the little probability of their being avoided	347
Course suggested for the great interests affected	348
Causes of delay	349
Political and industrial events since the Great Indian Peninsula Railway was proposed	350
Contrasted probable progress of the United States	351
Conclusion	351

	Page
<i>Practical questions affecting present proceedings.</i>	
Probability that a guarantee is yet necessary	352
Urgency of extension	352
Arising from want of cotton	353
———— necessity of realizing encouraging profits	353
———— the nature of the works on the ghauts, and of the country to be traversed	354
Disposal of the profits—principle	355
Present waste	356
Want of cross roads	357
Proposed distribution of profits between the shareholders and the making of cross roads	358
Authenticity and sufficiency of the evidence adduced	359
Importance of physical facts to political and social progress in India	360
Necessity for adequate commercial motives	361
<i>Interest in the subject.</i>	
Of British capitalists	361
———— merchants, manufacturers, engineers, and workmen	361
Of the educated natives of India	362
—— British-Indian Government	362
ists of Great Britain	363

APPENDIX A.

STATEMENT OF THE PRICES AND QUANTITIES OF EAST INDIA AND OTHER COTTON IMPORTED INTO GREAT BRITAIN FOR THE YEARS MENTIONED	365
Authorities	366
Dates of principal events connected with the supply of cotton from India to England	367

APPENDIX B.

REPORT OF R. STEPHENSON ESQ., M.P. C.E., TO THE DIRECTORS OF THE GREAT INDIAN PENINSULA RAILWAY COMPANY	369
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APPENDIX C

	Page
NOTICE OF THE PAPERS SUBMITTED TO MR. STEPHENSON, AND OF THOSE CONTAINED IN MR. CHAPMAN'S REPORT . . .	373
Estimated costs of construction and working, with probable dividend . . .	375

APPENDIX D.

LETTER OF J. CHAPMAN TO R. STEPHENSON, ESQ., M.P., ON THE REASONS FOR PREFERRING THE MALSEJ GHAUT . . .	377
--	-----

The crossing at Tannah	378
The Bhore Ghaut	379
The line from the Bhore Ghaut in the Concan	379
The northern and southern traffic	380
Poonah	380
The valleys of the Under, the Baum, and the Beema	381
———— Gor and the Meena	382
———— Kookree	383
The valley of the Malsej Ghaut	384
Peculiarities of the great scarp	385
Elevation of the principal passes	385
The Malsej not the highest	385
The Thul Ghaut road in the Concan, difficult, desolate, and unhealthy	386
The ascent of the Thul Ghaut	388
The comparative elevation of the Thul Ghaut	390
The valleys and country between the Thul and Malsej Ghauts	391
Superiority of the Malsej route	392
Comparative lengths of the present and the Malsej routes	P.S., 393

*Extract of a Letter to the Governor of Bombay, from the Chairman in that
place of the Railway Company.*

Necessity for crossing at Tannah	394
Local and commercial reasons for preferring the Malsej Ghaut	395
Commercial and engineering reasons unite in favour of the same route	396
Search for practicable valleys	396

APPENDIX E.

REPORT OF GEO. T. CLARK, ESQ., C.E., ON THE ENGINEERING
FEATURES OF THE CONCAN AND GREAT WESTERN GHATS.

Question limited by local formation to the country between the Thul and Bhore Ghauts	397
The river valleys in the Concan and the connected ghats, north of the Kaloo .	398
The Basta River	399
The scarp of the ghats and its crest	399
The Nana Ghaut, Seedghur, and Beema Shunkur, with the valleys of their connected rivers in the Concan	399
The ghats south of Beema Shunkur	401
Kotleegurh and the Koosoor Ghaut, with the connected ground in the Concan and the Deccan	401
The Bhore Ghaut	402
Peculiarities and advantages of the Malsej Ghaut	402

APPENDIX F.

ON THE TRAVELLING EXPENSES OF THE NATIVES OF WESTERN
INDIA.

Details of sixteen selected cases	404
On education	note, 407
NOTES ON THE MAPS	411

THE COTTON AND COMMERCE OF INDIA.

CHAPTER I.

THE PRESENT STATE OF THE SUPPLY OF COTTON FROM INDIA, AND OF THE QUESTIONS CONNECTED WITH IT.

THE importance of the manufacture of cotton will be readily admitted by all who take interest in the subjects discussed in the following pages. A system of industry which, however modern its origin, now occupies from 30,000,000*l.* to 40,000,000*l.* of British capital, affords employment directly to probably half a million of persons, and indirectly to very many more, and which supplies two-fifths of our 53,000,000*l.* or 54,000,000*l.* sterling of annual exports, requires no words to render intelligible its bearing on the well-being of our own country; while its branches in other lands, whether they be in the nature of the operations by which the raw material is grown in distant countries and then brought to our doors, or are extensions of the manufacture whose principal seat is amongst ourselves, or are the agencies by which the elaborated material in a thousand forms is distributed for the use and enjoyment of a thousand tribes, raise the whole system to a magnitude far surpassing that of the efforts devoted to any other industrial purpose in ancient or modern times. A check to this great system brings sadness and want to myriads of hearts and homes; the activity

of the whole; however, depends on the supply of the raw material.

Solicitude in respect of this supply has long been increasing; it is not indeed, even yet, more than proportionate to the importance of the object. The extraordinary manufacture of Lancashire practically depends on a single source of supply, the very singleness of that source constituting an inherent element of danger; while the peculiar circumstances which affect that single source of supply, and which need not here be pointed out, greatly aggravate that danger. Lancashire may any year be laid prostrate by causes from whose action she has no escape, and over which she has no control.

It is now, I believe, very generally admitted, that whatever hope there may be for the far future, and however prudent it may be to lay even now a safe foundation for such a hope, there is no chance of a large, effectual, and *early* relief from any of our own colonies, nor from other quarters, whether under European or native government, nor indeed from any country beside India. Doubts, which I hope to show unfounded, are even expressed whether as to quantity India itself can afford this relief: it is, however, agreed, I believe, that here, if anywhere, this additional supply of cotton is to be sought.

Before, however, any further investigation is entered on, it may be desirable to consider a question which, if determined adversely, might render all further inquiry useless. It has been said that even cheap and plentiful supplies of cotton from India might be of little value to us, on account of the inferior quality of the article.

An obvious and perhaps sufficient answer to the doubt thus expressed is the fact, that the greatest quantities of Indian cotton are bought and worked up in England in the years when the American supply is most scarce and dear—a fact which could not exist if Indian were not, to a considerable extent, interchangeable with American cotton. Direct evidence, however, to the same effect is not wanting. Mr. Bazley, president of the Chamber of Commerce of Manchester, in his evidence before

the Committee of the House of Commons on Indian cotton, in 1848¹, states that the manufacturers of coarse goods have a table by which they can see at a glance the respective prices at which American and Indian cotton are equivalent to each other—that is, a table in which the disadvantages of the Indian cotton are compensated by diminution of price. It is obvious that no such table could be of any service if Indian cotton could not be used instead of American. In the evidence of the same highly-experienced manufacturer are other statements leading to the same conclusion. Mr. J. A. Turner, President of the Commercial Association of the same city, who has strongly promoted the adoption in India of the American varieties, gives, in a letter to Dr. Royle, the following opinions²:—

“You ask, what is the Court to do as regards those districts in which the American plant will not thrive? My answer is, encourage the growth of the best cotton that *will* grow; induce the natives to pick it carefully,” &c., &c.

“Such cotton, although not equal to what I expect will yet be grown in India from American seed, will always be saleable and useful to the manufacturers of this country, at its fair relative value compared with other cotton,” &c.

“I believe that if Indian cotton is sent home clean, there will be an increased demand for it; and that it is very unlikely that the spinners will discontinue to use it, even if American cotton recedes from its present value; though of course they would, in such case, only use it at its relative value compared with American. You need not fear that it will go out of use, if, as you say, it can be produced at 1½*d.* per lb. by the ryots in India, as we have good grounds for supposing that America cannot produce cotton within 50 per cent. of this price. You must, however, provide good roads by which this cheap produce can be cheaply and expeditiously conveyed to the port of shipment, and at the same time preserved from adulteration.”

Dr. Royle, in a paper dated October, 1847, inserted in the evidence reported by the above-mentioned Committee, page 67,

¹ Report, page 48.

Report, page 67.

says, "It is evident that Indian cotton possesses some good qualities of its own. Among these I may mention colour, swelling of the fibre in bleaching, and particularly the facility with which it takes colours in dyeing. There can be no doubt, therefore, of the importance of improving the indigenous cottons of India, even though they are not applicable to all the purposes of American cotton."

Presuming that these authorities are ample for establishing the eligibility, in point of intrinsic quality, of such Indian cottons as are commonly brought to England, or at least of such a degree of suitableness as renders Indian cotton, on occasion, an available substitute for American, at a price corresponding with its qualities, it remains only to remark that the kinds of goods for which it can be used are said to amount, in weight, to 75 per cent. of our total cotton manufactures; that is, that out of 480 millions of pounds of cotton which we have annually imported, 360 millions might have been of Indian cotton, without detriment to our convenience or interests. This estimate, which is necessarily vague, and for which I can only quote general concurrence, as I have understood it, without specific authority, agrees very well with Mr. Bazley's opinion, expressed in his evidence, that "we might be receiving to an extent of not less than 5,000,000*l.* sterling value per annum more than now:"¹ a value which, at 4*d.* per lb. in Liverpool, implies an import of 300 millions of pounds above our present receipt.

Little doubt then, I apprehend, can remain either as to the desirableness of a large and cheap supply of such cotton as it is well known India has always produced, or of the importance of every fair investigation into the circumstances affecting the supply at present, or likely to improve it in future.

The following table² exhibits the proportion and actual amounts of cotton annually supplied to England from different

¹ Report, page 50.

² Derived from Burn's Statistics of the Cotton Trade, page 17, and the Report of the Committee on the Growth and Export of Cotton, appointed by the Government of Bombay in 1848, printed as Parliamentary Paper No. 712, of 1847.

QUANTITY IMPORTED.

parts of the world, on the average of the thirteen years ending 1846:—

	Per cent. of the total supply.	lbs. supplied.
From the United States	79½	380,568,958
„ Brazil	4½	21,462,150
„ Egypt	2½	12,123,790
„ West Indies	1	4,432,777
„ East Indies	12½	61,578,371
	100	480,166,046

Considering that India is the country in connection with which we have been longest acquainted with cotton, in both raw and manufactured forms; considering the vastness of its area and population; considering the intimacy of our connection with its affairs, and the extent to which our commercial relations with it have shown a tendency to develop themselves; it is not a little calculated to induce inquiry, to find that of so vital an article we derive but 12 or 13 per cent. of our supply from that country. Nor does it diminish the necessity for further investigation, to learn that efforts for extending and improving the supply were commenced nearly 70 years ago by the East India Company, and have been continued to the present time. It is agreed, I believe, that the success of these efforts, although often remarkable in particular instances, has not, in relation to the general supply, been proportionate to the exertions made, or to the wishes of those who made them. To state the reasons assigned for the continuance of this scantiness of supply, notwithstanding these efforts, and to make some necessary remarks on them, may serve to show both the present position of the question, and the state of things to which my eventual argument will apply.

It is said that the indigenous cotton of India is of a staple inferior to that of America: accordingly, the efforts of the Government have chiefly been directed to establishing the use of a better variety of cotton plant, and of improved modes of

THE COTTON AND COMMERCE OF INDIA.

culture. 'In 1810 and 1811' the Court of Directors gave their attention to the despatching to India of Bourbon and other seeds, and soon after we find their wishes seconded by corresponding steps at Bombay. Seeds of every kind of cotton have been sent to India from that day to the present; and yet we obtain, in the ordinary course of commerce, only indigenous cotton. In truth, it is not easy to change the habits of any people by mere efforts from a foreign source; and when, for anything the cultivators can see, they shall profit at least as much by growing their own plant as a foreign one, they require an amount of teaching and persuading which cannot be artificially applied to a whole people. Only interests, constantly and naturally operating through the ordinary agencies of commerce, could bring about a just appreciation of, and permanent preference for, a better plant and better culture. The difficulty of establishing such a preference is much increased by the fact that the native cotton of India has properties in which it excels that of America, although it falls short of it in others; and it is certain that the natives of India believe the cloth made of their own variety to be much more durable than that made of the cotton of America; the produce of the exotic plant, therefore, if not sold for export (and its sale has hitherto appeared to the native uncertain), seems only likely to be sold in the country itself at a disadvantage and a loss. The cautious Hindoo, commonly bound by debt to the little local dealer who takes his crop, cannot afford this risk, and so hesitates to depart from the usage under which his fields have been cultivated. These, I apprehend, are among the chief hindrances to the general adoption of the better qualities of cotton which the natives of India have so often been solicited to grow.

Nor is it quite clear that in process of acclimatization the foreign plant does not gradually approach to the native, and ultimately coincide in quality with it. Symptoms of some such

¹ Reports and Documents respecting the proceedings of the East India Company in regard to the culture and manufacture of Cotton Wool, Raw Silk, and Indigo in India, in 1836; pages 31, 40, 55, &c.

AMERICAN COTTON AND CHOICE OF SOIL.

change have been recorded, but the fact seems not yet to be established as of universal occurrence.

Continued and widely-extended experience in the cultivation of the plant would detect, and might prevent or control, this tendency; but these require the establishment of an interest in its cultivation, which no existing motive is powerful enough to effect.

But even the general adoption of a new and better plant would not meet some of the chief difficulties of the case. The native cotton, as it appears in the pod before it is gathered, is an article far fitter for the English market than when it reaches the port of shipment. All the damage it receives on the road would deteriorate, just as much, the produce of a better plant. By all the difference between transit on an American railroad and a journey of hundreds of miles on bullocks' backs, or along miserable unbridged cart tracks, would the produce, even of the American plant, if grown in India in full perfection, be inferior to the cotton sent to us from America; and it may be doubted, after all, whether the disadvantages of Indian cotton do not arise in a greater proportion from the treatment it receives than from its own particular nature.

Nevertheless, it may well be admitted that an improvement in the produce of India is requisite to obtain for it a sure and permanent standing in the market, *at an equal price* with that of America; and different views have been advanced as to the means of effecting this desirable object.

One of the earliest suggestions seems to have been that of Major-General Briggs, who in 1839¹, from long acquaintance with the country, and careful observation of its varied productions, expressed a belief that the cause of the repeated failures of Bourbon and other foreign cottons in India, had arisen from their being planted in the black soil, on which alone the indigenous kind is grown; while the red soils, although poorer in nature, seemed more likely to suit the habits of the American plant. These views have received important confirmation from

¹ The Cotton Trade of India, 1840, page 44, &c

the subsequent observations of Dr. Wight in the south of India¹. General Briggs, therefore, 'deeming it fortunate that the red soil, while it is more lightly taxed than the other kind, is best adapted to the more valuable American variety of cotton, urges that particular attention should be directed to this circumstance, in the hope that, between a better produce and a smaller tax, the native may perceive such a prospect of profit as may strongly enlist his energies in the cultivation of the kind of cotton we desire.. Here, however, we are again met with the uncertainty to the native of a foreign market,—a market of which he knows little beyond its mysterious variations. If his cotton when grown cannot be sold, it is small comfort that he has not paid so much tax on his land; for, in a vast majority of instances, he must have bestowed on it the labour he would have given to some saleable, although not very profitable, article. Confidence and experience are wanting; timidity takes their place.

It may be inquired, too, whether the whole rotation of crops on the red soils, of which cotton can only be a member, recurring at certain intervals, will pay on the whole, so as to leave this stimulating profit to the advantage of the exotic cotton;—a question not unaccompanied with doubt, from the fact that this red soil seems to be, for most purposes, so inferior in quality and produce as to require to be taxed at a lower rate.

Nor is it quite certain that any increase in the production of cotton in the far interior, from whatever measures it might arise, if unaccompanied by other improvements, would be followed by an increased export of that article: for the means of transit, in many parts of India, are the limit to the export, and are themselves not unfrequently worked up to the limit set, even to them, by the natural capabilities of the country to support the hordes of pack cattle which traverse it, or by the possibility of

¹ Return of the House of Commons of papers in possession of the East India Company, on Cultivation of Cotton in India, No. 439, 1847, page 325, &c. Report of the Committee of the House of Commons on the Growth of Cotton in India, No. 511, 1846: evidence of Mr. Patric, page 178. &c.

traversing under rains or droughts a country so devoid of roads and bridges.

If, however, due means of transit and certainty of sale were once established, it would become of vast importance to know that this large class of soils, long deemed useless as to cotton, could be profitably brought into operation.

Some authorities, and amongst them, I believe, are to be quoted the very important names of Dr. Royle and Dr. Wight, deem the amount of moisture, and its distribution over different periods of the plant's age, as of greater importance than even the character of the soil. The success of garden cultivation of cotton all over India, even where ordinary field cultivation wholly fails to produce it of the requisite quality, seems to give countenance to some such idea; and the known necessity for attending to such circumstances in the cultivation as shall regulate the moisture which lies on the ground and has access to the roots, together with that of varying these measures according to the locality, so as still under different circumstances to produce this requisite effect, leads still further to a hope that researches in this direction will not be without value; and a variation in the time of sowing has been said, on the authority of Dr. Wight, to improve the crop, by taking better advantage of the hygrometric state of the atmosphere, or of the falling of rain, at different periods of the plant's growth. If this view should eventually be established, the necessity for large works of irrigation will become apparent. But in most parts of the west side and centre of the peninsula of India, the possibility of cheap, certain, and extensive irrigation depends on that of cheaply lifting water, during the dry season, from the beds of rivers 40, 60, and 100 feet below the surface of the adjoining lands; and, again, this depends on a supply of artizanship diffused over the whole country, which India does not possess, and which nothing would be so certain to raise up as the establishment of improved lines of transit, and especially of railways.

Some practical suggestions as to culture have been made by

Dr. Royle, Dr. Wight, the American cotton planters, and others, but not at present, it appears, to much effect on the general cultivation of cotton amongst the natives. Indeed it has been said, that little remains to be taught to the natives of some parts of India as to the treatment of the plant¹; on the other hand, however, Dr. Wight² expressly attributes a crop of double the ordinary weight, raised by Mr. Simpson in Coimbatore, to more "skilful agriculture at starting." It is hardly to be believed that the rude implements and scanty means of the Hindoos should produce results which we know to be everywhere else dependent on the use of instruments and appliances derived from science and mechanical skill in their most advanced condition; and yet competent observers unite in saying much that is to the credit of Hindoo agriculture. One probable explanation is, that the natives are shrewd and intelligent observers of nature (working, however, almost without tools), while under present circumstances they have little to induce them to go beyond their wont. A constant market, and that alone, I apprehend, would make them willing learners of any improvements likely to secure to them its advantages, and would thus give to the researches and recommendations of scientific men a practical value of which counteracting circumstances at present deprive them. Certain it is that the great pains taken to investigate and improve the cultivation of cotton in India, have hitherto failed to affect appreciably the general supply³.

¹ Mr. Mercer, Report of Committee of House of Commons on Indian Cotton, page 235.

² Return, 1847, page 361.

³ In this connection I may add, that on inquiry of some of the first botanical authorities, and especially of those who have devoted attention to Indian productions, I learn that little or nothing is known of the peculiar function of cotton wool in the vital system of the plant which produces it. If its physiological place in that system could be ascertained,—if it could be learned what it does for the plant itself,—I apprehend some hope might be entertained of a method of treatment being devised which, by requiring or encouraging the production of that particular vital effect for which the plant depends on the fibres we require, should lead to results to be somewhat more certainly anticipated than those of the merely tentative kind of investi-

Much stress has been laid on the want in India of better modes of cleaning cotton for exportation to Europe. No doubt the means of cleaning are now wretchedly bad, and have always been so. As early as 1794, the Court of Directors sent out improved machinery for this purpose from England. This it will be observed was immediately after the invention in America of Whitney's saw gin, probably before the existence of that machine, and certainly before its important effect on the cotton cultivation of America, could have been known in England. From that date to the present an important portion of the efforts and correspondence of Government in relation to Indian cotton has been on this part of the subject; nevertheless, Indian cotton in general is as dirty now as it was in 1794. The explanation lies, I conceive, in the circumstances and habits of the people, and in the want of sufficient inducement and opportunity to effect generally the changes which must precede the common and habitual use of better machinery for cleaning.

One common feature characterises all the attempts which have been made (and they are many) to introduce improved cleaning, viz., an effort to adapt the machinery to the admitted poverty and mechanical inexperience of the people. Now what probability can there be of maintaining in general use, throughout a widely-dispersed agricultural community, a kind of machinery which depends at present for its construction and repair entirely on imported skill? The very hand gins lately sent out by Government, to the number of 200, are evidence of the state of things known to exist; they are the saw gin of America, dwarfed down to a fifth or so of its original magnitude, to suit the equally dwarfed capabilities of India. It is quite consistent with the credit due to the Government for this attempt at immigration hitherto necessarily pursued. Odd as it may sound, I have an impression that experiments to ascertain what is this vital function of cotton wool, would be best made in Manchester, where excellent cotton has already been grown, where the means of producing artificial soils and climates in any variety are so cheap and abundant, where the requisite science and skill of all kinds are at hand, and where there is so great an interest in the success of the inquiry.

provement, to say that the case which requires such a modification of this machinery rests of necessity on facts which no mere importation of machinery can seriously affect. Poverty and *want of skill like these require a searching of their cause and radical remedies; and were it not for other facts besides those connected with the cleaning of the cotton, we might pretty confidently conclude that no increased supply could be had from India, except as a consequence of vast and slow improvement in the condition and capabilities of the people.*

Late intelligence from India states that a law against the adulteration of cotton, which has rested many years unenforced, has just been brought into activity again. How far laws against adulteration can be made of permanent avail, let the state of trade in every part of the world testify. The immoralities of trade are always borne with when it is a profit to both sides to a bargain to endure them. Of the laws on this subject which exist (and they are to be found in almost every country which has laws at all), nearly all sleep in the ordinary course of things, and nearly all are occasionally woke up under the pressure of some temporary vexation. But the new activity is always put to sleep again by the old convenience, and adulteration, as far as law is concerned, goes on just as before. The merchants themselves could put down adulteration if they pleased, and they will as soon as it is profitable to do so; meanwhile all experience seems to say, that if it be profitable to buy and sell adulterated cotton, they will buy and sell it, as their fathers did, and as everybody else would do. America, I believe, finds no need of laws against the adulteration of cotton.

When to the foregoing are added some suggestions as to better means of shipping the cotton at the little ports of Guzerat, and other matters of detail, we have exhausted the list of attempts or recommendations which refer to the plant itself, with its cultivation and the treatment of its produce; nor does there appear much reason to hope either that the list will be materially extended, or that future results from such recommendations will be more important than those already wit-

nessed, until other measures shall have prepared the way for the success they unquestionably deserve, and, in themselves, are well calculated to secure.

The questions of a more general kind, which have been raised in relation to this inquiry, refer to the desirableness of European capital and superintendence in the growth of the article,—to the want of European mercantile agency in the interior, for the purchase of the cotton when grown,—to the effect of the native local demand,—and to the land tax. I defer the question of roads.

No doubt there is great reason to wish for a more intimate connection of some kind between the agriculture of India (especially that of cotton) and the capital, skill, and science of Europe; an opinion from which there can be no dissent when it is remembered that the crops of cotton in India are little above 100 lbs. per acre at the best, and often not half that amount, while in America they are from 300 to 600 lbs.; but it may well be doubted whether this desirable connection can be maintained by means of the personal supervision of Europeans, in the case of a raw and bulky agricultural product like cotton, however well that arrangement may have succeeded in the very different cases of sugar and indigo. In the latter cases the cultivation of the plant is still, I believe, chiefly with the natives, while the great advantages of European improvement and supervision have been, for the most part, required by and bestowed on the processes by which the manufactured result has been obtained from the gross agricultural product. Not so with cotton; it is of itself the gross, unchanged agricultural product (except as to the mere separation of the seeds), and it is produced under circumstances which leave little chance for effectual supervision to an extent which can much affect the vast supply we require. And beside the great annual breadth of the cotton crop itself, it must be observed that cotton is but one member of a rotation of crops, and that an English agriculturist in India must take under his charge all the rest of the series,—an incumbrance and a dis-

advantage which must go far towards neutralizing the benefits of European supervision as applied to cotton, but which do not attach so much, if at all, to the culture, or rather the manufacture, of sugar and indigo, in respect of which European enterprise has been so successful in effecting improvements.

European commercial agency in the interior has been much insisted on, as a means of giving certainty to the market, on the spot, for cotton grown for exportation to England. Judging, however, from their conduct in other matters, the merchants of Bombay have no lack of a spirit either of enterprise or of prudence; and if their experience had not led to a belief in the unsoundness of such an arrangement under present circumstances, we can hardly believe that they would have omitted to adopt a measure so often suggested to them and so obviously connected with their own interests¹. But if, as I believe will hereafter appear, the commerce of cotton between India and England has always been in a state of great uncertainty and hazard, and if those risks, great as they are between Bombay and England, are still greater between the interior and Bombay, it is every way likely that prudent European merchants will leave the last-mentioned part of the business to be transacted by native merchants, whose connections, habits, and information better qualify them to deal with its difficulties, although in so doing the manifold public and private advantages which would result from European familiarity with the

¹ "They" (the merchants of Bombay) "have, however, on more than one occasion, deputed young men in connection with their firms to superintend the purchase and cleaning of cotton in Guzerat. The result was, however, unfavourable; in proof of which the committee would here give a brief outline of an attempt recently made by two European agents so deputed." * * * "ignorance of the country and language;" * * * which when removed "only revealed to them the further difficulties they had to encounter;" * * * "the opposition of the wakarias" (middle-men, brokers), who stimulated the cultivators to imposition in everything, and to distrust the agents because they were Europeans;—want of buildings and machinery, and of permanent property in land;—constant risk of breaking up all interests by sickness or death of agents, &c. The committee go on to discuss the difficulties which at present prevent the permanent settlement of Europeans in the interior for commercial purposes. Report of 1848, page 512, &c.

interior in commercial matters, are necessarily foregone. It may show that these considerations are of no small force, to remark that the present commerce in cotton between Berar and Bombay was originated, and is chiefly carried on, by native merchants; and, on the other hand, that a gentleman habituated all his life to the country, and perfectly familiar with its products and its people, Mr. Fenwick, settled himself some years ago at Khamgaum in Berar, in this very business of providing cotton for Bombay, but, after some years of exertion, was compelled by the difficulties of that trade to relinquish it.

No just parallel can be drawn between the officers of Government and the agents of a mercantile house, as to residence in the interior. The failure of a Government agent is a mere matter of estimate and opinion, and its consequences are spread over, and incorporated with, the entire proceedings of the Government;—it is merely an item, commonly not of very appreciable amount, going with many others to make up a general average. Contrariwise, the mercantile agent must achieve a distinct and measurable success on almost every distinct transaction; at least, his average must speedily incline to the right side, or his principals may be ruined. Twenty Government officers may blunder or die, through the disadvantages of their position, and the Government in general feel no such effect as shall endanger it; but the loss or error of one agent might shake irretrievably a commercial house. To say, then, that Government can maintain its officers everywhere in India, is to say little for the possibility of establishing to any advantage European commercial agencies in remote agricultural districts of the interior. Nor, with these risks before them, can it be surprising that the merchants of Bombay should prefer to leave the traffic of the interior in the accustomed hands of natives, rather than awaken the jealousy and disturb the relations of the existing agency, with so many doubts attaching themselves to the prospect of a successful result of a change.

Believing that I shall satisfactorily show hereafter that the source of all these difficulties lies in the wretched state of the

means of transit (which cannot be said to the same extent of the parts of India where European agency has been successful), I shall now confine myself to remarking that European agency in many parts of India has discouragements which do not apply to Bengal. There, European residents are tolerably numerous and near to each other; and communication with the capital is neither difficult nor infrequent: moreover, the European is there under British law, and is amenable to *British courts*. But to be of any service in providing cotton, an agent must often locate himself where sickness or other emergency would find him far from European aid¹, without the resources or influence of an officer of Government, and where he would be liable to the capricious justice or injustice of native authorities. It can hardly be doubted that a person competent to grapple with the duties and difficulties of such an appointment, would be so appreciated as to have choice of occupation at once more lucrative than this hazardous business could afford to be under competition with native agency, and more consonant to European habits and wishes.

These, I apprehend, are some of the difficulties which have prevented the general establishment of European commercial agencies in the cotton countries of Berar and the Deccan. They are, no doubt, such as unusual energy, talent, and de-

¹ "Sept. 23, Friday (1842).—Late yesterday evening I set off to see Blount, who is very sick: and I arrived at Humeerpore after dusk. During the night fears were entertained that he would not recover, but this morning he is decidedly better, thanks to the attention of Dr. Sill. In a country like this, where diseases are sudden and violent, it is important that every person who values his own life, or is of any consequence to Government, ought to be in reach of medical aid. Even situated so near as I am to a station, if I was suddenly taken ill, as no bearers can be procured here, I might die before I could possibly get aid. Blount was fortunately better situated in that respect, for he could get bearers in a few moments, which he did, and came into Humeerpore, where he had a physician to prescribe, and friends to give him medicine, and to attend carefully to him; otherwise he must have paid the great debt of nature in a strange land amongst strangers. No very pleasant reflections these to a man of delicate constitution; fortunately they do not trouble me much."—From Mr. Finnie's Journal, Return of 1847, p. 190. This is an extreme case of a common class.

votedness might confront and perhaps overcome; but, for large and wide-spread operations and results, we must reckon only on average men, and such men could hardly be expected to succeed here. It cannot, however, be doubted that, on the establishment of suitable means of transit, these difficulties would rapidly disappear, and that mercantile stations would soon be found as thickly set on the line of a railway in the Deccan as they now are on the banks of the Ganges.

I do not include uncertainty of land tenure in the existing difficulties of European agency in the interior, in relation to cotton, for, as I shall hereafter show, our chief additional supply must come from territories under native government, where an Englishman would scarcely choose to settle; and, I have reason to conclude, from some proceedings in my own case of application for a lease of land, as well as from their constant professions, that the government of the East India Company are well disposed to obviate any difficulty of that nature in their own territories, as far as consistent with native rights, although it seems to me they have not, in some cases, taken a course calculated to secure their own object of encouraging the enterprise of Europeans in connection with the territorial improvements and agricultural products of India.

The local native demand for cotton is always greater than that for export, except in a very few districts. In Guzerat, apparently, the growth must be chiefly for export; so to some extent must it be in some parts of the South Mahratta country; but I think hardly in any other parts of India. What we receive, therefore, is merely a fraction of that produced for another and a very different market; and as our demand for Indian cotton, always fluctuating and uncertain, from its subordination to the chances of the American supply, becomes extremely fitful and capricious by the time it has reached the cultivator in the interior of India, nobody is there induced to lay out his means in providing for it. The native consumption of cotton has been estimated at quantities varying from a little under 1,000,000,000 lbs. to 3,000,000,000 lbs. per annum, while

the demand for Britain has been but 60,000,000 lbs.; and the total export from India, including that to England, China, and all other places, has not been much more than 150,000,000 lbs.¹, or from one-eighth to a twentieth of the whole growth; and this, being chiefly drawn from particular districts, favourably situated for the purpose, has left the greater part of the country wholly unaffected by the demand, and other parts only fitfully affected by it, and that in slight degrees.

Under these circumstances, it seems more surprising that we should obtain any cotton from India than we should obtain so much less than we want; and we may be little astonished that that which we do obtain conforms, in quality and cleanness, rather to the more slovenly requirements of its greater and nearer market, than to the higher and more precise conditions of our own.

When, however, our demand becomes steadier, and natives have embarked their interests in making provision for us, we may reasonably expect the same improvement which took place in the United States from the same cause. Indian cotton, even now, is not worse than once was American²; but America, placing herself in position to need our market, kept it by con-

¹ Report of Cotton Committee of Bombay, page 29.

² "As slovenly as was originally the tillage of the cotton plant, the preparation of its produce for market was much more so. It was, indeed, so badly cleaned, as to be deemed suitable only to the coarser fabrics. Up to about the year 1820, the gatherers took no especial pains to abstract the decayed leaves. The wool was sunned all day, and ginned frequently with the stained particles incorporated with it. These were removed in the process of moting, which was effected by women sitting on the floor, where it was beaten with twigs. During the operation of ginning no bags or boxes received the cotton, and oftentimes large quantities were thrown together, until the moters were prepared to examine them. In packing, an old iron axletree, or wooden pestle, the present instrument, was used. There were no re-inspectors of the cotton before it was deposited in the bag, in which the spinner would frequently find, in addition to a large supply of leaves and crushed seeds, potato skins, parts of old garments, and occasionally a jack knife. With many the cotton was ginned, moted, and packed in the same room. Very different indeed are the present processes, or rather the modes in which they are severally performed," &c. &c.—Seabrook on the Cultivation of Cotton.

forming to its constantly-advancing requisitions of staple and cleanness, which, for the most part, India, in her native interests, as apparent to the grower and dealer in the interior, has little need to do. It is the business of England to afford the inducement which has operated to so excellent effect in America.

The land-tax is frequently held, and as frequently denied, to be the great obstruction to the growth of cotton in India. Without attempting to discuss this great question in its general bearings, it may be rendered tolerably clear that this impost is not the cause of the scantiness of our receipt of the staple; or, at least, that that scantiness may be accounted for on more certain grounds. Guzerat, as I hope to show, which really requires in justice a reform of its land-tax, and is probably obtaining it, has long grown cotton for us, nearly to the utmost of its ability, and yet supplies but $6\frac{1}{2}$ per cent. of our consumption; Coimbatore and Tinnevely, limited like Guzerat, in area of soil suitable to the purpose, could not afford us, at the utmost, so much as double that quantity in addition. The rest of India (except the great cotton field in its centre, to be afterwards adverted to) has never grown *such cotton as we can use*, whether under native or British rule,—whether under light or heavy assessments; and its failure hitherto is attributable to natural causes, to the exclusion of any necessity, or perhaps opportunity, for supposing it to be occasioned by others of a fiscal nature—to causes remediable, perhaps, but not merely or chiefly by improved revenue arrangements. The great cotton field of central peninsular India, where the staple is produced in any quantity, at prices varying chiefly from $1\frac{1}{4}d.$ to $1\frac{3}{4}d.$ per lb., is for the most part under native government, and its land-tax is beyond our control;—there that impost is excessive, capricious, and exceedingly detrimental¹; nevertheless, that country grows cotton better and more cheaply than any other part of India, and has always done so.

¹ “The land-tax is not fixed in the Nizam’s country, but, generally speaking, it absorbs almost the whole value of the produce, whether cotton or grain, and frequently more. Under such circumstances how the ryots contrive to subsist would

Without, therefore, denying or diminishing the importance of the questions relating to the land revenue of India, it seems that this particular subject of the growth and export of cotton, is not so affected by them as to afford much hope of sufficient increase of export, by any future settlement of those questions on an improved footing, within the territories under our own control.

Some examination, however, appears to be required by an argument which is sometimes employed to sustain the opinion that the land-tax has no effect whatever on the growth of cotton. It is said, "Land, in most parts of British India, pays the same tax, whatever may be the crop grown on it. If of two crops grown on such land, say grain and cotton, grain be the most profitable, it will still remain so whatever change may be made in the land-tax: and if so, then a change in the

appear a paradox; but it is pretty well known, I presume, to all who have investigated the matter, that they live mainly by what they pilfer from their own fields before the harvest, by the labour of the women of their families and their own, by the milk they get from their cows and buffaloes and the sale of their young, and by the hire they obtain for their carts in the transit of goods. From December to April they have very little field work to perform, and are therefore able to employ their cattle in the manner I have mentioned."—*Letter of R. H. Fenwick of Khamgaum to J. C., 7th Sept., 1846.*

"In the territories of the Nizam government, the cultivators of the mahals of Zilla Berar are required to pay the same assessment for cotton fields as they pay for grain fields, sugar-cane plantations, &c. The rates of assessment are not different for different fields. The revenue of lands on which cotton is grown is farmed out. The cultivators, to whom the mokuddums, putwarrees, and zumeendars are partial, are required to pay small assessments, although their fields are large. Again, some are required to pay heavy assessments, although their lands are small. For instance, the rate of assessment levied from the people for cotton fields, varies from 4 annas to 1½ rupee per beegha. The poor are thus oppressed and ruined, and are not able to cultivate their lands afterwards. In ancient times it was customary to measure land, and to fix the assessment according to its capabilities. But this practice has for a long time been discontinued, and the assessment of a field is now always fixed by guess. In consequence of this state of things the poor people are ruined, and the government also suffers loss. If, therefore, the officers of government, in conformity with the ancient practice, were to measure lands, and fix the assessment according to their capabilities, the government would be benefited, the people happy, and the country prosper."—*Statement of Seraj Ool Moolk, Minister of the Nizam; from the Report of the Cotton Committee of Bombay, page 63.*

land-tax will not increase the inducement to grow cotton, since it will still remain the least profitable crop." This, however, assumes that the cultivator is under the necessity of growing either cotton or grain,—that, in fact, the alternative lies between cotton and grain, and not between cotton and nothing. Now the land of India pays no rent or tax when it is not cultivated; when, therefore, it is a question (perhaps occurring in the course of the rotation of crops) whether cotton shall be grown or not, it may very easily happen that the price of cotton does not enable it to pay the tax, and so the crop be omitted altogether, and the tax avoided. Suppose then, for simplicity, a district growing only grain and cotton, and (as is often the case) that half the area of the district will grow food enough for its inhabitants; if, through great cost of carriage, or any other cause, cotton, when grown, cannot commonly be sold at a profit, it will not long be grown at all, and the half of the land, which would otherwise have been cropped with it, will lie fallow and pay no tax. The argument applies to any other product as well as to cotton. The cost of carriage for the bulky coarse articles, which of necessity constitute the chief produce of India, does, in fact, form great part of their cost at the port of shipment, and even at the place of Indian consumption, if at but a moderate distance from the place of growth. These two great elements of cost, therefore,—land-tax and carriage,—act on and with each other; and heavy land-tax, with costly carriage, may easily keep large tracts of land uncultivated, although the land-tax affects all alike. Lighter land-tax or cheaper carriage, might permit the choice between cotton or nothing to be determined in favour of the former. These considerations seem to show that the amount of land-tax is far from inoperative as to the choice of articles to be cultivated; and, I apprehend, they account also for the fact so observable in the effect of newly-opened roads in India,—viz., that the traffic on them is not so much an abstraction of business from other routes, as a clear addition to the commerce of the country.

It is requisite to notice an argument which has been employed to show, not how the supply of cotton from India is to be ex-

tended, but to prove that its extension is impossible: it has been said that that country, being old and populous, is subject to an amount of rent which is incompatible with the cheapness requisite to such an extension. It might be a sufficient answer to this objection, that the question has already advanced beyond it. India does now actually produce cotton cheap enough to be received at a profit by England, if only ordinary and well-known means were employed to transport it. It is to no purpose to say what any particular theory of rent would lead to, when we know already what actually takes place. The facts are practically known so far in the series as to include the effect of rent; and they turn out to be such as not to prevent the growth of cotton fit for us at satisfactory prices. There is the cotton, actually grown at $1\frac{1}{4}$ d. per lb., and abundance of unoccupied land ready to grow more at the same price.

But further;—this argument seems to be founded on a hasty and incorrect generalization. It is concluded at once that all India, an old country, is so populous as to subject the land everywhere to the pressure of rent. It appears, however, that this is not the case. Even in the valley of the Ganges, where the population is in some districts from 500 to 800 to the square mile, one-third of the cultivable lands are not cultivated; and in the Deccan, from which we must chiefly look for increased supplies of cotton, the population, amounting to about 100 to the square mile, is maintained by light crops grown on little more than half the cultivable land. So far, indeed, is the population from being packed together, that there is plenty of room for them to migrate within the country, as oppression or leniency, disorder or quiet, famine or plenty, may induce them. Nothing is more common than the desertion of a country which is harshly taxed, and the re-occupation of it by its former cultivators, or their descendants, on the advent of better rule;—so also, a local famine drives the people for a time to more favoured districts (since the condition of the roads prevents food being carried in sufficient quantities to them), whence they return to their homes and hereditary lands on the re-appearance of favourable seasons and plenty. These things could not be if the

population were dense enough to create rent of such a degree as materially to interfere with the cost of production. If a man is discontented with his holding, or is dispossessed of it, he can find, in almost any British district, unoccupied lands on which he may enter, liable only to a fixed government assessment. In the native states, the barbarous extortions, in the name of taxes, which sometimes take place, do not operate as rent, otherwise than in driving the people to another territory;—they cannot be correctly classed as rent at all.

No doubt the adoption of a scale of imposts varying with the quality of the land, appears at first sight to imply the principle of rent; but the fact that a large proportion of the cultivable land lies uncultivated, although without any practical hindrance to appropriation, proves that the principle operates, if at all, to a very limited extent; and this would appear still more strongly if, as I believe is the case, the unappropriated were not always found to be the worst land. Under such circumstances, only that part at most of the impost which forms the difference between the payments for the best and worst lands under cultivation, is rent; all the rest, under any supposition (perhaps more), is tax, not rent, and will remain so until the population shall have become so great as to occasion a demand for food admitting a premium for permission to cultivate even the worst lands, in comparison with the employment of labour and capital in other pursuits.

But it may be shown, I think, that the public impost on land in India is not rent at all, and that to regard it as rent leads eventually to error. Rent, or the annual premium paid for the use of land, increases *per head* with the population: tax, or the annual contribution to the expenses of the common protection, decreases *per head*, as the population increases.

As the population, in the course of its increase, presses at any given period on the existing supply of food, the demand for land increases; and rent on the highest qualities of land (taking for quality the combined effect of fertility, convenience, security, &c.) becomes measured by comparison of its advantages with those of successive lower and lower qualities, rent being the

difference in value to the cultivator (and paid over by him to the owner) between one quality and another; this difference, being a part of the entire value of his products, the cultivator realizes from the consumers, from those, in fact, who are fed by his land. But as any given area feeds, under the increased pressure of population, only as many persons as it did before, it follows, that increase of rent lays on each of those persons (or, failing them, on the cultivator, as a sacrifice of profits to the same amount) a greater quota of contribution than before. Rent, therefore, increases with the increase of the population, and that not only absolutely and in gross amount, but relatively, and on every head of the population. Every man pays more in the price of his food, or the farmer pays it for him out of his profits. It is an increase per head.

Contrariwise, under title of tax, every man, as the country becomes more populous, pays or should pay less. For, to govern a thickly-peopled country, does not require, proportionally to the numbers of the people, so great an expense as to govern a thinly-peopled one, both being supposed to be brought up to the same degree of public and individual security. Three hundred to the square mile would obviously not require ten times the expense of thirty, perhaps not five times. The cost to each person is diminished by the much greater numbers to be served by slightly-increased establishments. The public taxes of England, as far as they relate to the current cost of government, have been greatly lightened *per head* since the beginning of the century by the mere increase of the population.

Since then rent *increases* and tax *decreases*, with an increase of population, the light in which the land-tax of India is viewed must at some period lead to the assertion of one of two opposite principles. If we say that however the real expense of government, as distributed on each person, may be hereafter diminished, the government may still have the right to take all the rent, we rest at once on the principles of an oriental despotism, and say that government is a property, not an office, and we obstruct or prevent the growth of a middle class; and if we spend the surplus wisely and benevolently, on objects beyond

the true functions of government (which is the most favourable supposition the case admits), we adopt, *pro tanto*, the essential principle of socialism, viz., the enforced partnership of the whole community. If we restrict the impost to the amount necessary for the expenses of the government, we make it tax, not rent; we adopt the constitutional principle that government is an office, not a property; we promote the growth of a middle class; and we set in action what seems to me the vital principle of all progress, viz., the independence of the energy, the intelligence, and the responsibility of each man in his individual capacity.

The historical and administrative considerations connected with this subject have been fully adduced by Major-Gen. Briggs in a book¹, which is, of necessity, in the hands of every person who wishes to understand the land revenue of India. These considerations I feel myself incompetent to discuss; nor does my argument require the discussion of them. It may be enough for me to say, that the simplest and truest view of the land revenue of India seems to me to be that of an income tax, assessed chiefly on agricultural produce, because that is the principal kind of annual result, and that it bears to some extent the appearance of rent, from such an income tax, measured by the amount of agricultural produce, falling heaviest per acre on the best lands. In accordance with all sound principle, I apprehend that, first, the increase of the funds yielded by this tax, in consequence of increase of population and of cultivation, will be spent in affording a higher degree of security than now exists; and that, afterwards, the tax itself, stationary or nearly so in total amount, will be diminished per head with the increase of population.

If it be apprehended that rent will hereafter limit the production of cotton in India, we have only to see what has to be done before that can happen. First, the waste lands of India, comprising, I believe, nearly half its cultivable surface, and some of its richest soils, must have come into cultivation;

¹ The present Land Tax of India considered as a Measure of Finance, by Maj.-Gen. (then Lieut.-Col.) John Briggs, 1830.

next, agriculture, with its mechanical and chemical aids, must have become so advanced as to bring the weight and quality of the crops of India more nearly than at present into conformity with those of other countries; and, lastly, its enormous cost of carriage must have been reformed. Until all these have reached their limit, I apprehend that rent cannot, in India, *limit production for export*, although it may effect a different *distribution of the annual proceeds*; for until these have produced their full effect, there will still be a reserve of power of paying rent.

I should not here have ventured on remarks on some of the subjects connected with rent and land-tax in India (especially since it can be but imperfectly discussed on the present occasion), but for the purpose of showing cause for deeming altogether mistaken that denial of the capability of India to produce cotton, plentifully and cheaply, which rests on the *theory of rent*. That theory, I apprehend, is wholly inapplicable to the case as it at present stands; it may, for an indefinite time, remain inapplicable. At any rate, whatever may be said about rent, cotton is now actually grown and sold at prices which would make it amply profitable to bring it to England, if only it were conveyed by decent means of carriage to the coast.

Of the considerations hitherto adduced, which I think include all that have been much insisted on, except roads, some advert to measures which, however judiciously conceived and diligently pursued, have not, with many years of trial, produced a sufficient, hardly even, have they produced an appreciable, result; and others, although often and strenuously urged, do not derive from experience much probability of an issue corresponding, in any degree, with the extent of our requirements. However valuable may be hereafter such of these suggestions as bear a practical character, I conceive that, at present, they fail of their effect through causes which must be removed before they can have fair and sufficient operation. The remedy for the backwardness of India, as far as they are concerned, it seems is still to be sought: the object of the following chapters is to assist in the search.

CHAPTER II.

PRODUCTION AND PRICES OF COTTON IN INDIA.

IN seeking to ascertain by what class of measures the supply of cotton from India to England may be beneficially affected, my purpose is to be guided by facts of that broad and unquestionable character which, while it excludes alike the accidental influence of varying seasons or temporary circumstances, and the errors of individual observation, shall avoid reliance on the promising but uncertain issue of experimental researches and novel proceedings. Any hope to which this inquiry may lead will be indulged only in the light of the past.

The general course of the argument will be as follows:—the export of cotton from India to England has risen just as the costs of, or impediments to, the transmission of the cotton have been diminished;—that costs and impediments still remain, which are sufficient to account for the known paucity of the supply;—that, judging from the past, and from the power of growing acceptable cotton which certain parts of India are known to possess, the diminution of those costs, and the removal of those impediments, would be sufficient vastly to increase the supply;—and lastly, that the increase of the supply would necessarily be attended with the only circumstances by which an improvement of the quality of Indian cotton can be extensively and permanently affected.

The right understanding of this argument, as well as the correct eventual application of it, requires some preliminary local investigations.

India, too often spoken and reasoned of as one country, is, in fact, a vast collection of countries. It extends over more than twenty degrees of latitude. The elevation of its surface

above the sea is exceedingly varied. Its several districts are very dissimilar in their seasons, in their streams and waters in the quantity of rain they receive, in the moisture and dryness of their atmosphere, and in the character and composition of their soil. The variety of its natural productions attests that of the influences to which its many divisions are respectively subject. Of such regions it may well be asked, are all parts alike adapted to the growth of cotton? And this inquiry derives force from the fact that, even in countries most habituated to, and most successful in, the growth of cotton, there are limits of adaptation to the production of this peculiar fibre, which cannot be profitably transgressed. If there be in India territorial peculiarities, which either confine the production of cotton to certain parts of this vast surface, or even much favour or discourage it, there can be no doubt of the importance of clearly ascertaining the fact, lest hopes, efforts, and, above all, time, should be thrown away, which the urgency of the interests to be affected can ill afford to lose. The fact that all India produces cotton of some kind renders it still more important to guard against being misled into reliance on parts of India, which do not produce cotton *fit for English use*.

The following table shows the quantity of cotton annually derived by England from the different Indian ports during the thirteen years ending 1846, together with the total quantities exported by each of them to all countries:—

	Proportion supplied of total consumption in England. Per cent.	lbs. per annum exported to England ¹ .	lbs. per annum of total export to all the world ² .
From Bombay . . .	11½	55,201,231	117,303,312
„ Calcutta . . .	¼	1,293,982	19,507,600
„ Madras . . .	0·8 } 1	3,973,074	13,174,112
„ Tuticorin . . .	0·2 }	1,110,084	3,247,328
	12½	61,578,371	153,232,352 ³

¹ Report of the Bombay Committee, pages 24, 26, 27, 28. These amounts are obtained by reducing the amounts given by the Committee, in the proportion of 800 to 866, in order to make the Indian amount of export agree with the English one of import. See Report of Committee of House of Commons, page 342.

² Ditto, page 29.

³ The average of the export from America to all countries in the ten years ending 1843, was 556,621,790 lbs.—Commercial Tariffs, &c., Part XV., page 626.

The great preponderance of the supply from Bombay, which is shown by this table, raises of itself the presumption that the territories commercially connected with that port have proportionate natural advantages for producing the article; for in everything but such natural advantages the three divisions of India are nearly equal¹. A review of the principal facts connected with the growth of cotton in the different divisions of India will lead to the same conclusion.

Bengal does not produce cotton fit for English use. During the period which immediately followed our acquiring the government of this province, when its manufacture of cotton goods was stimulated by the then new demand for them for *general* use in Europe, Bengal did not grow enough for its own consumption, nor one-eighth of that required by its manufactures². The quality of the cotton which it does produce has never been found suitable to English modes of operation; accordingly, Calcutta, which exports to China quantities averaging 17,000,000 lbs. per annum, sends to England less than 1,000,000 lbs., and has latterly sent not one-tenth even of that small quantity³. This fact is the more remarkable and conclusive from the difference of price between the cotton of Calcutta and of Bombay having often been such as to have afforded the former a strong inducement to share largely in the export to England, whenever it was practicable by the latter, had the article itself been suitable. But I understand that whenever such an export has been attempted on a considerable scale it has proved a failure.

A bare perusal of the reports of the collectors of the various districts of Bengal in 1789⁴ is sufficient to show that little cotton was then grown there which was valued even by the

¹ The only advantage enjoyed by Bombay, and that not of a nature to affect this argument, is the great superiority of its port, amounting in effect, I am told, to 1*l.* per ton; or (since 1 cubic ton of shipping carries 1375 lbs. of cotton), to 0·175 pence per lb.

² Reports and Documents, 1836, pages 17, 20, and 122.

³ Report of Bombay Committee, page 26.

⁴ Reports and Documents, 1836, pages 302, &c.

natives, the greater part of that produced being extremely coarse, and fit only for the lowest purposes. Little or no improvement seems to have taken place since that time. In 1828 Mr. Hunt reported to the East India Company, that "Bengal cotton may be fairly considered as out of use by the British manufacturer¹.

Here, as elsewhere in India, garden cultivation has occasionally produced encouraging samples of cotton; and improved cultivation may possibly, at some period, raise the character of the field crops. At present, however, it is clear that no trust is to be put in Bengal for cotton².

¹ Reports and Documents, 1836, page 422.

² The celebrated muslins of Dacca require notice from the inference they have afforded that Bengal grew cotton of corresponding quality. The argument was evidently not conclusive; for the cotton worked up at Dacca might have been grown elsewhere, just as that worked up in Lancashire is grown in the United States, or in the still more striking case, as that employed in the similarly fine manufacture at Chunderee, in Malwa, is grown near Mhysir*, on the Nerbudda, distant 250 miles. No research has yet discovered a cotton plant in Bengal, whose produce seems at first sight worthy of the reputation of the Dacca muslins, although the manufacture of those celebrated tissues has but latterly become extinct, and ~~was~~ in its full vigour scarcely fifty years ago.

"It is true that, on critical examination, the thread and muslins of Dacca, and of Chunderee, do not justify the oriental expressions which have been employed to describe them; it is said that thread has been produced in Manchester, from Sea Island cotton, much finer than that of Dacca, and that these oriental webs "of woven wind" do not much, if at all, exceed in beauty and fineness our best Scotch cambrics. Yet enough remains to require that the apparent absence or extinction of a plant suited to so remarkable a manufacture should be accounted for. The case is best elucidated by the statement of Mr. Taylor, of Hurriaul, made in 1789, while the manufacture was yet flourishing. He says, "The finest fibres of kuppas" (cotton not yet separated from the seed) "are those which adhere firmly to the seed, and from which they can be separated only by a machine. From this superior part of the kuppas, the spinners who make the finest thread carefully remove, by means of a fine comb, all the looser and coarser fibres. By this operation the fine part of the kuppas is rendered perfectly clean, and can be spun by fine spinners to any degree of fineness. This process of separating the finer from the coarser fibres appears to create the distinction between the capacity of the dessey kuppas" (that grown in the country) "and the Surat cotton. The fibres of the latter being all mixed, it is not

Bundelcund and the North-West Provinces grow cotton in large quantities, which amongst the natives and for native purposes has always been in reputation; it is no doubt superior to that of Bengal, and is probably more cheaply grown. In 1796 it supplanted the native cotton of Bengal, then in use for the manufactures of that district required for the European market, although it had to bear charges of transport, duties, &c., to the amount of 186 per cent. on its original value¹. Still, however, to the produce of these countries the strong inferential argument applies, that, if it were fit for English use, the export of Calcutta to England could not fall off, while that to China is maintained.

The reports of Messrs. Mercer, Finnie, and Terry, three of the American planters sent to India by the Government, leave

*capable, from its inequalities, of being spun into such fine thread as the dessy; yet equal care in the original preparation of it seems alone wanting to give it that ability. The spinners, excepting those who make the finest thread, in general prefer the Surat cotton to the dessy kuppas, the last requiring trouble to separate the seeds from it, and the first being so far ready to their hands." * * * "The dessy kuppas is particularly adapted, for the reason which has been assigned, to the manufacture of the finest thread, it differing only from the coarse thread made of inferior kuppas in this, that it will be soft and strong. When it can be procured at Hurriaul it is preferred to all other kuppas."*

This statement shows clearly that the Dacca muslins were made from the common cotton of the country, the short fine fibres of that cotton, which were firmly attached to the seed, being separated for that use from the longer, coarser, and looser fibres which formed the bulk of the pod.

To this also agrees the statement of Dr. Irvine*, as to the treatment of the cotton employed in the manufacture of the equally fine cloths of Chunderree. He says, "The cotton is never separated by the churka, or wheel and rollers, but by the fingers of men and women in their houses. For the inferior cloths, however, the cotton is separated by a small bow and string, two feet only in length, in the houses of the cultivators or labourers. The fine extracted cotton is only used to weave, and is not sold."

These easy explanations of the mystery show that the cottons from which these celebrated webs were fabricated, were precisely such as English spinners would reject.

¹ Reports and Documents, 1836, page 16.

THE COTTON AND COMMERCE OF INDIA

~~no doubt on the subject.~~ The former, besides making other similar statements, writes from Raüt in Bundelcund as follows:—"With Bundelcund, hot winds, drought, short crops, and famine are its certainties; abundant rain and produce its accidents, over which its wretched inhabitants rejoice with the fulness of rejoicing."¹ Mr. Terry says, "I do not believe that we can ever be successful enough here to make cotton, so as to make the expense of growing it," and expresses a wish to be removed to a damper climate². Mr. Finnie says, from Agra, "*I have visited the cotton bazaars and the custom house, where Mr. Plowden kindly had samples of cotton collected, and some large cotton dealers from whom I learned that there was about 500,000 maunds' (about 18,000,000 lbs) 'shipped at Agra annually, and the largest supplies were received from Jaepoor and other places in the immediate neighbourhood. The cotton I examined was of miserable quality, and duty withal; cotton is produced all over the country, in greater or less quantities, but all very nearly of the same quality, the characteristic of which is coarse, short, and filthy, but I doubt not that an abundance of such as it is could be contracted for, and by care we could insure cleanliness, and might gradually improve the quality; but a short staple is peculiar to dry countries; for, as I have before remarked, the boll is forced open by the heat before the fibre has matured; and I am borne out in the opinion by the cotton dealers, for they say that, in very dry seasons, the cotton is much worse than in ordinary ones.*"³

A more encouraging account is given by the last-quoted planter, of spots he occasionally met with in his examination of the country between Agra and Kumaon, and of a few boat-loads of cotton brought on the Ganges from the interior; but all his efforts to obtain an improved description of cotton in the north-west provinces eventually proved abortive. "The model farm" (at Agra, page 94) "was a complete failure"

¹ Return, 1847, page 137.

² Return, 1847, page 140

³ Return, 1847, page 204

It is said that the defeat of the efforts of the American planters arose from the occurrence, at the time, of two unusually dry seasons, and from their having been restricted to the introduction of the American plant, instead of being allowed to improve the native. But it is clear that, although their particular failure might be so caused, their observations were sufficiently general to supply a just account of the average capabilities of that part of India; and it is admitted that the improving of the native cotton depends on the introduction and general adoption of an improved system of agriculture, while it is not shown what inducement is to lead to so general a change, which has not operated without effect in these quarters for many years past. Cheapness, if not facility, of carriage by the Ganges, and the presence of European agents, have done here all they are likely to do, and yet the cotton of the Gangetic valley does not reach Lancashire. The probable explanation is, that these countries cannot so maintain competition with other parts of India, for a share of the export of cotton, as to make the improvement of the article an object; and that, accordingly, the growth is absorbed by local wants, to which the article in its present state, and without further risk or trouble, is adapted. I have not been so fortunate as to meet with recent prices of cotton in those quarters on the spot, and can therefore only offer the foregoing as a probable conjecture; nor is it impossible that time, and better information, may bring these immense regions to contribute to our supply of cotton; but their present disadvantageous standing can hardly be doubted. Mr. Mercer thus forcibly illustrates the inferiority of Bundelcund to Berar for the production of cotton—"I send you along with this a lock of the Amrowtee" (Oomrawuttee) "cotton, which Mr. Fraser sent me. It most clearly proves to me what you said to me in America, in describing the climate in which it grows; evidently it is as different from this of Bundelcund as possible. I will bet any money that Amrowtee seed is as perfect a failure here as the Sea Island; and I will

¹ Return, page 137.

also bet that the Mexican seed will grow admirably where the Amrowtee is produced. This Amrowtee is about what the Sea Island would be, if sown broadcast in the fields of Lake Concordia, or more probably on the poplar hills of Jefferson County."

The general tenour of the foregoing observations, and the fact that the cotton of the Gangetic valley is not now shipped in any appreciable quantities to England, are conclusive against reliance on this part of India for supplies, at least in the present state of the cotton cultivation, and afford considerable presumption that circumstances will not soon occur sufficiently powerful to greatly and generally improve it.

We turn now to Malwa, of the cotton of which the information is not very extensive or precise. S. Fraser, Esq.,¹ classes its produce with that of Bundelcund, and says that the cotton of Berar, imported into Malwa, sells for twice the price of the Bundelcund cotton; from all which the great inferiority of the cotton of Malwa, as well as that of Bundelcund, is easily inferred. Mr. Finnie's examination² of fifty-nine samples shows that some may be procured of superior quality, and such as would be well received in the Liverpool market; but there is no indication of the localities producing the better kinds, nor of the price of them, nor of the quantities procurable; indeed, considering that Malwa imports cotton, and that its native cotton is classed only with that of Bundelcund, it seems not impossible that some of these samples were not really of local growth, or, if of local growth, then that the amount of the supply is limited by local causes. Malwa has of late years so devoted itself to the growth of opium, as to import not only cotton but even grain. Under these circumstances, whether relating to natural adaptation to the purpose, or to more profitable occupation with other crops, there seems little probability of a supply from Malwa; and it may be added that, even if suitable cotton were cheaply grown there, the means of transit are wanting.

The mountainous country of Rajpootana, the jungles which

¹ Return, 1847, page 123.

Return, 1847, page 237.

separate Malwa from Guzerat, and the arid desert of Marwar, require no special investigation; the well-known physical features of some, and the equally well-known industrial condition of the others, preclude all expectation of deriving cotton from these countries.

The coast from Calcutta to Madras is next to be examined. Mr. Tucker's well-known paper, dated 17th November, 1828¹, states, that attempts had then lately been made to cultivate cotton in the province of Cuttack, but that it was understood they had not succeeded. In 1832, Mr. Weekes sent to the Agri-Horticultural Society of India at Calcutta² a specimen of cloth, remarkable as being the first piece which was ever made there from cotton the produce of the town, which was also of his own growth. Notwithstanding his confident anticipations of future success and profit, it does not appear that this example was followed. An attempt by Mr. Pringle, in 1834, appears to have failed³, and a sample grown from Pernambuco seed, by Major Syers, in 1837⁴, was declared in Calcutta to have lost nearly all the character of the plant from whose seed it was produced. In 1838, a sample of "Upland" gengia, grown in the Society's branch garden at Cuttack, was declared to be "a very poor specimen, that appears to have been neglected and carelessly picked."⁵

Considering that Orissa was midway between, and at no great distance from Bengal and the Northern Circars, two of the great seats of manufacture where cotton cloths for Europe were produced, and that it had sea carriage, and, for India, tolerably good land carriage, between both, and considering that these manufactures actually drew their supplies of the raw material from the distant countries of Surat, Berar, and the Upper Ganges,—it is hardly to be supposed that any cause less powerful than natural inferiority for the production of cotton suitable even for native modes of operation, prevented this extensive

¹ Reports and Documents, 1837, page 160. ² Transactions, ii., page 132.

³ Transactions, ii., page 147.

⁴ Transactions, v., pages 51 and 55.

⁵ Transactions, vi., pages 107 and 111.

and fertile district from participating in the demand. In accordance with all previous facts, it now supplies, I believe, no cotton for export.

Proceeding southward, it may be remarked that the exportation of cotton from Madras to England is very small, amounting from the whole presidency to little more than 16,000,000 lbs. per annum, of which our share is not much above 5,000,000 lbs. per annum, or 1 per cent. of our consumption. Considering that some districts of celebrity for the production of cotton, of necessity effect their export by way of Madras or its dependent ports, it follows, from the extremely limited extent of export, either that the rest of these extensive territories are unfit for the growth of the fibre, or that very much requires to be done to render their capabilities available.

The following references will exhibit the state of the case as to the Presidency in general: the different districts may be then examined. In 1814 the Government of Madras obtained, from the commercial residents and collectors of the various districts, answers to a circular set of questions, relating to their growth of cotton'; the results may be classed as follows:—

The Jaghire (a district near Madras), Nellore (to the north of Madras), Canara and Malabar (both on the western coast), produced no cotton.

Ganjam, Vizagapatam, Rajahmundry (with its factories of Injeram and Madapolam for the supply of cotton fabrics to Europe), Masulipatam, and Guntoor, (collectively, the Northern Circars,) grew altogether little more than 3,000,000 lbs. per annum.

Cuddalore, Tanjore, Trichinopoly, Ramnaud, Dindigul, and Madura, produced about the same quantity of 3,000,000 lbs. per annum, several of these districts importing cotton, even for local use.

Of Tinnevely and Coimbatore no quantities are given, or can easily be inferred; but the cultivation was considerable, and the capabilities of the districts are well known. These will be more particularly considered hereafter.

Cuddapah and Bellary produced between 6,000,000 and 7,000,000 lbs. per annum, at the rate apparently of about 30 lbs. of clean cotton per acre. Considerable quantities passed through those districts, probably from the northward and eastward.

I revert now to the northernmost of the above-mentioned districts, viz., the Northern Circars. In 1800, the manufactures here situated were supplied with cotton from Berar, of a description much superior to that of home growth; and this state of dependence on the produce of "foreign countries" was noticed with anxiety by the British authorities of the day, and means were recommended with the view of promoting the growth of cotton of the requisite quality at home¹. The cotton grown in the district was used to adulterate that brought from the interior. In 1810, Dr. Heyne, who was in office at the factories of Injeram and Madapollam, states that cotton, although cultivated at some places, did not form part of the general crop of the country.² In 1814 occurred the inquiry by the Government, of which the results are given above.

Dr. Roxburgh remarked, in 1819³, that "the fine Madras (more properly Northern Circar) long cloths, were made of Berar cotton, brought by Sada, Palawansa, &c., to Yernagoodmum, in Masulipatam." In 1820, the value of the cottons grown in the Circars may be inferred from the opinions given of examples transmitted to England by the Government of Madras⁴, of which the Court of Directors state that "they are said to exhibit qualities and defects that will render the cotton unfit for advantageous importation into this country." In the same year the Court of Directors advert to the dependence of these manufactures on cotton brought from the interior, and to the scantiness and inferior quality of the local supply⁵; and in

¹ Reports and Documents, 1836, page 18.

² Tracts on India, 1814, pages 283 and 332.

³ Coromandel Plants, vol. iii., page 66.

⁴ Reports and Documents, 1836, page 102.

⁵ Reports and Documents, page 126.

the following year Mr. Tucker, in his paper before quoted, reiterates the statement¹.

These facts, whose pertinency seems to be brought down to the present time by the continuance of a very small export from Madras, apply to the country along the coast from the south of Orissa to Nellore, whence the reports to Government in 1814 carry us to some distance south of Madras, in concluding that no crops of cotton fit for English use are produced in countries between the sea and the high lands of the interior. The conclusion might indeed be extended to Cape Comorin but for the exception of Tinnevely.

It must not, however, be overlooked, that in one of those districts, viz., Vizagapatam, in 1836, no less than 1150 lbs. of seed cotton, or say probably 380 lbs. of clean cotton, were said to be produced on an acre²; an amount of produce far surpassing the average of India, and approaching the yield in America. Success like this, unless derived from exceptional advantages, should have given to this district, in the fourteen or fifteen years which have since elapsed, an eminence amongst the sources of our supply of cotton which does not seem to have been attained by it. In Trichinopoly, at the same period, 783 lbs. of seed cotton per acre were produced, a result less singular from the previous and subsequent success of other efforts in the same quarter. These isolated instances of remarkable produce do not affect the general character of my argument. They show indeed the physical possibility of raising large crops of cotton in these districts, and so far they are highly valuable, as affording hope that improved cultivation will hereafter greatly extend the area of supply; but, as so far reported, they do not show whether this success was obtained under circumstances which might justify an expectation of its being repeated, or by means which placed the same result within the reach of the population in general.

The districts between Madras and Cape Comorin effect their export most conveniently by the port of Tuticorin. The average

of thirteen years ending 1846 shows the amount of this export to have been 3,250,000 lbs. per annum; but the average of the last seven years of the series reaches to 5,000,000 lbs. *These quantities enter into the export of Madras; but they serve to show the small comparative capabilities of these districts, which, although they had the advantage of including the collectorate of Tinnevely, so highly reputed for its growth of cotton, afforded but an export so small that had it all come to England it would have borne hardly any appreciable proportion to our wants. Except, then, as to Tinnevely we may reasonably conclude that not much is to be expected from the coast districts between Madras and Cape Comorin, at least until some advance in cultivation, or some new perception of interest, shall have rendered natural advantages, if any exist, more available than at present they appear to be.*

The most interesting, as well as the most recent, attempt at improvement in this quarter, is that of Mr. Lees, described by him to his fellow-citizens of the Manchester Commercial Association, and reported in the Manchester newspapers of Aug. 17, 1850. It consists in sowing cotton very near to the sea. Its success is yet uncertain, but it is too encouraging to be lightly abandoned. If, however, a band of a mile in breadth, extending from Cape Comorin to Madras, could be given to this purpose, and one-fourth of it cropped with cotton every year, the produce would probably not exceed 7,000,000 lbs.; an aid valuable indeed, but not of an extent to justify neglect elsewhere.

The small and excellently governed native principality of Travancore grows, I believe, no cotton for export: and all authorities agree that Malabar and Canara are unfit for the growth of cotton, and in fact produce none.

The Concan is well known to grow little or no cotton; but it does not clearly appear whether this is owing to natural disadvantages or to other causes. The remarkable success of Mr. Elphinston at Rutnageree, is said to prove that nothing can be done in that quarter without artificial irrigation, for which the

facilities in the Concan are unusually scanty¹. On the other hand, the occasional occurrence of wild cotton, supposed to have descended from foreign varieties planted in early experiments here, seems to indicate that the natural circumstances of the country are not altogether unsuited to the plant. As far, however, as the case is at present understood, no dependence can be placed on this country. Great part of the Concan north of the Kaloo River is occupied with forests.

The elevated country of Mysore is next to be considered; it extends from a short distance south of the Kistna River to near Coimbatore, and spreads over the greater part of the peninsula in breadth. In this tract Bellary is 1600 feet, Sera, 2223 feet, Bangalore, 3000 feet, and Seringapatam, 2321 feet above the sea. The chief product of this elevated region is grain. In 1801, this country, then recently subjected to our power, was examined by Dr. Francis Buchanan, by order of the Governor-General. Cotton, except of the worst kind, and in small quantities, was not found to be amongst its products; that required for local consumption was imported from Coimbatore, from the South Mahratta country, and from the Nizam's dominions; considerable quantities also passed through this country on its way to Madras and to the western coast. The manufacturers of Bangalore, since cotton would not grow in their own neighbourhood, derived large supplies from the country between the Kistna and Toongbuddra, from Dharwar, and from Bellary. No account of more recent date has fallen into my hands; but I apprehend that the accordance of Dr. Buchanan's statement with the present amount of the export from both coasts renders further evidence unnecessary².

Cutch and Scinde remain to be considered. The former, of doubtful natural adaptation to the plant, is occupied by a population too scanty and too rude to render available even such ad-

¹ Letter of Dr. Gibson of 24th Nov., 1841, para. v., Transactions of Agri-Hort. Soc. of Bombay, July, 1843, page 49.

² Dr. Buchanan's Journey from Madras through Mysore, Canara, and Malabar, 1807, i., page 203.

vantages as the country may possess. ~~Scinde~~ ^{Scinde} has not yet exhibited any tendency to produce and export cotton fit for our use, and is, perhaps, too little known to us as to its actual capabilities to admit of a positive opinion of any kind. Both these countries together have supplied to Bombay but 5,000,000 lbs. per annum, to which they have contributed nearly equal quantities.

The foregoing enumeration of districts, which are evidently of inferior capacity for the growth of cotton, or at least for the growth of cotton fit for English use, includes the whole of India, except the countries from which we at present receive the staple; these are Coimbatore, with Tinnevely, Guzerat, and the country to be hereafter more particularly described, which may be roughly defined as lying between the Nerbudda and the Kistna in latitude, and extending in longitude from near the Western Ghauts to Hyderabad.

Before I proceed to a more particular discussion of the cotton-producing capabilities of these remaining countries, it is necessary to remark that my argument does not go to deny that, eventually, many parts of India may be brought to supply acceptable cotton. Garden cultivation of the cotton plant has often succeeded, where the field crops have been of very inferior value. For instance, the Concan grows little or no cotton, except, perhaps, on a few bushes sheltered and tended near the houses of Brahmins, the produce of which is used for the fabrication of the threads worn as a distinguishing mark by the members of this priestly caste. But Mr. Elphinston, at Rutnageree, by careful crossing produced cotton of remarkable excellence, while, by irrigation, which cost nearly half of the first year's total expense of cultivation, he obtained plants which eventually yielded a profit¹. Examples, like this, although in most cases not so striking, are supplied by many other parts of India. If, then, I attempt to show the superiority of the countries I am about to describe, it is superiority in this particular view—that their natural advantages are such as to render that

¹ Return of 1847, page 418.

an easy and common result of cheap field culture, which in other parts of India can at present only be obtained by the care and expense of garden culture. In what their advantages consist I do not pretend to decide: the effect is all that my argument requires.

Coimbatore and Tinnevely, near the southern extremity of the peninsula of India, have long attracted attention to their cotton, and here were located some of the manufactures which supplied cotton fabrics to Europe. The uncertainty of the seasons, however, greater here than in some other parts of India, rendered the produce "dearer than that of the northern districts, and the calicoes of the southern division of the Indian peninsula were early supplanted in the European market by British manufactures."¹ If not the best adapted to English purposes of all cottons grown in India², the produce of these districts is at least acceptable; while the reputation long maintained by "Hughes's Tinnevely cotton," and the successes, although partial, of Dr. Wight in improving the cultivation, afford much reason to believe that the attention and efforts now directed to these districts will not fail of ultimate effect; it may be hoped that they will lead to greater certainty and perhaps value in the crop, and induce the native population to embark largely in the cultivation for supply to England.

But with every advantage, and every probable degree of improvement and advance, the supply from this quarter can never be more than a small part of that required for the consumption of our manufactures. Mr. Petrie, who spent several years in the Coimbatore district, prosecuting, in the service of the East India Company, the extension and improvement of the supply, estimates "the extent of country in the district of Coimbatore, in which the American cotton might be successfully cultivated, at the very lowest computation, at 2000 square miles, or 1,280,000 acres."³ If this estimate be trebled, so as to

¹ Reports and Documents, 1836, page 127.

² Evidence of Mr. Petrie. Report of 1848, page 182.

³ Report of 1848, page 178.

include the suitable lands of other districts, and those on which the native plant may be grown,—if the crop be taken at 100 lbs. per acre,—and if cotton be supposed to be grown on each field every fourth year,—we shall have a gross product of 96,000,000 lbs. per annum. Subtracting from this one-third for the coarse local uses of the country (in stuffing, ropes, beds, saddles, &c.), and also something more than 7,000,000 lbs., the present average annual export from Madras to China, the remainder, amounting to about 56,000,000 lbs. per annum, would be eleven times as much as we at present receive from Madras, and yet would not afford us quite 12 per cent. of our consumption.

This computation, although avowedly conjectural in some particulars, can scarcely fail to show, with sufficient clearness for present practical purposes, that a supply of cotton, though important yet insufficient, may in time be obtained from the provinces of Coimbatore, Salem, and Tinnevely. But since it must require a long time to bring up the production to anything like the amount here indicated, and since even then the product would meet but a small part of our requirements, it cannot be doubted that the hopeful and important measures in progress for the improvement of this quarter of India, and in particular for the amelioration of its growth of cotton and its means of transport, leave untouched the necessity for careful investigation and vigorous efforts elsewhere.

With full recollection of the importance to England of a large supply of cotton, let us now see what Guzerat, at present the chief source of our Indian cotton, is likely to afford us.

In the twelve years ending 1846 Guzerat exported on an average 59,678,000 lbs. of cotton¹, which, being divided at Bombay, along with all received from other quarters, into supplies for China, foreign Europe, the Straits of Malacca, &c., gave to the share of England, on an average, 30,650,000 lbs. per

¹ Report of Bombay Committee, page 33.

annum¹, or about $6\frac{1}{2}$ per cent. of our total import of 480,000,000 lbs. per annum. The question is,—can Guzerat produce much more than 59,678,000 lbs. of cotton per annum on an average of years? The following particulars will lead to the answer.

Chicklee, on the eastern side of the Gulf of Cambay, and Tulaja, south of Gogo, on the western, are probably the extreme points of the cotton country of Guzerat, which between them stretches for a length of 220 miles round the head of the gulf. The average breadth of the cotton-producing country is certainly not more than 35 miles². The gross area is, therefore, 7700 square miles. From this gross area we have first to subtract the space covered by the sites of towns, beds of rivers, uncultivable spots, permanent pasturage, &c., amounting (if we follow the proportion ascertained by Col. Williams for one of its collectorates, that of Baroche) to 2660 square miles³, leaving a cultivable surface of 5040 square miles; but as part of this is deemed unfit for cotton, and is never sown with it, and on the rest it is found not to answer to grow cotton oftener than every third year⁴, we may conclude, with little risk of error, that the annual cropping of cotton does not exceed one-fifth of the cultivable surface, that is, one-fifth of 5040 square miles, or 1008 square miles, which contain 645,120 acres. The average yield can hardly be placed higher than 110 lbs. per acre⁵; and from these figures would result a total crop of 70,963,200 lbs.

¹ Deduced from facts given in the Report of the Bombay Committee: see Report of 1848, page 340.

² This estimate is rather greater than the area indicated in the map given by Col. Grant, in his book entitled "Bombay Cotton and Indian Railways."

³ Memoir of the Zilla of Baroche, page 48, where the lands cultivated and fit for cultivation are stated to be 545,119 $\frac{1}{2}$ acres, out of 832,926.

⁴ Williams' Memoir on Baroche, page 57.

⁵ From Williams, pages 48 and 57, it may be deduced that the unusually good crop of 1817-18 was not greater than 102.3 lbs. per acre. Page 14 of the same book gives for the Jumbooseer pergunnah, in the same year, 133 lbs. per acre. Mr. Davies (Report of Bombay Committee, page 38) estimates the average of all soils

But since Guzerat has exported for twelve or thirteen years together, on an average, near 60,000,000 lbs. per annum, and has sometimes exceeded even 70,000,000¹, there can appear very little reason to expect much increase from this quarter, in the present state of the cultivation.

This view of the case derives support from the belief of Sir John Malcolm in 1833, that the increase of the cultivation of the plant had not been great in Guzerat since that country came into our possession, and from the estimate he gives of 200,000 bales, or 78,400,000 lbs., as the quantity produced for export². So also a comparison of the various statements made by Col. Williams, whose very elaborate examination of the collectorate of Baroche was made in 1817, with those of Mr. Davis, the collector there in 1847, shows not only that but small increase has taken place in that particular division in the land cropped with cotton, but that nearly all was devoted to that article at the latter period, which had long before been estimated as fit for it³.

In truth, the full cotton-producing power of the province seems to have been called forth by the revival, we may almost say the commencement, of the export to England in 1813; for in 1817-1818 Col. Williams states⁴ that "kuppas had of late years become a primary object of cultivation in this collectorate as well as in the adjoining pergunnahs, in consequence of the advance of its price from 45 rupees to about 70 rupees per bhar,"—equal to from 3½d. to 5d. per lb. for clean cotton.

and seasons at an amount equivalent to 76½ lbs. per acre; and Mr. Stewart, collector of Surat, gives an average which is equal to 84½ lbs. per acre.

¹ These quantities include some Candeish cotton sent by way of the Coomdabaree Pass to Surat. Bombay Report, page 13.

² On the Government of India, page 125.

³ In 1817-18 it may be deduced from the statements of Col. Williams that about 117,000 acres were cropped with cotton in Baroche: the average of ten years preceding 1845-6 was, according to Mr. Davies, 140,000 acres. Of 181,000 acres (less some amount of unsuitable land) deemed eligible for cotton in 1817-18, nearly 164,000 were actually so cropped in 1845-6.

⁴ Memoir of the Zilla of Baroche, 1825, page 41.

The tenor of these facts scarcely leaves it to be questioned that Guzerat is now supplying to us nearly all we can expect from it, at least until great improvements, if such be practicable, take place in its agriculture: and it is further evident that there is no such probability of addition to the $6\frac{1}{2}$ per cent. of our consumption, which it now affords, as ought to diminish in any degree our solicitude as to supplies from other parts of India.

I proceed now to describe the great central cotton field of India, on which I apprehend the chief hope of a sufficient supply must be rested, and to which the greatest efforts should relate. First, however, the following table will show from what ports of Western India, and in what proportion from each, Bombay itself, and, through it, England, are supplied with cotton.

	Proportion supplied of total consumption in England.	lbs. per annum ¹ exported to England.	lbs. per annum ¹ of total export to all the world.
From Guzerat	6.38	30,650,977	59,873,639
„ Concan	3.23	15,748,905	30,763,610
„ Malabar and Canara . .	1.25	5,981,723	11,684,583
„ Cutch and Scinde . . .	0.58	2,763,126	5,397,439
„ All other quarters . . .	0.01	56,500	110,366
	<hr/> 11.50	<hr/> 55,201,231	<hr/> 110,366

Of these quantities that which at present chiefly interests us is the supply through the Concan, which very nearly represents the amount we now receive from the vast area whose cotton-bearing capabilities I am about to discuss: this supply amounts to $3\frac{1}{2}$ per cent. per annum of our consumption; or, if we add to it the quantity brought through the ports of Malabar and Canara, so as to include all which comes by way of Coomptah, we shall a little exceed the truth, and even then the supply to us from this part of India does not reach 5 per cent.

It may serve to point out the courses taken by this commerce to subjoin the following table, which shows how much

¹ Report of 1848, page 340.

each port of the Concan contributes to the gross export of that province to Bombay, it being borne in mind that all which is exported from the Concan is really derived from the area in the interior now under consideration.

	Per cent. of the total consumption of England.	lbs. per ann. of average annual supply to England.	lbs. per ann. of total export to all the world.
Through Omergaum, Tarrapoor, Mahim, and Bassein	{ Extremely small. }	3,632	6,437
Through Callian	1.35	6,471,762	11,539,449
Through Caranja and Salsette	—	—	—
Through Panwell	1.54	7,391,427	13,178,885
Through ports south of Panwell from Sanksey to Rutnageree inclusive . }	0.05	226,011	402,992
Through Viziadroog or Gheriah . . .	0.19	936,344	1,669,626
Through Malwan	0.15	719,748	1,283,343
Through Sawunt Warree	—	—	—
	3.279	15,748,924	

Here it is seen that the supply from Berar and the Deccan passes to Bombay chiefly through its dependent ports on the continent, Callian and Panwell, a small part of the produce of the southern districts taking the route of Viziadroog or Malwan¹.

¹ These general conclusions, expressed in so condensed a form, do not exhibit the very remarkable increase of the export through the port of Coomptah, in Canara, consequent on making a single road in the interior. The case is one of those which show the extraordinary effect of the opening of good roads in India, and consequently discloses some of the evils which now exist from the want of them. In 1839-40, Capt. Ditmas, of the Madras Engineers, constructed a cart road from Bellary to Sirsee, a distance of 140 miles: the last-mentioned place is near the brink of the Great Western Ghauts, and the road from it to the port of Coomptah was still left unfit for carts. The traffic of the port rose in three years from 180,000 lbs. per annum to 400,000 lbs., and the customs' duties from 4622 l. to 18,015 l. The exports of cotton to Bombay from the districts of Canara, in which this port is situated (although the district itself grows no cotton), amount on the average of the seven years preceding the opening of the road to about 5,750,000 lbs. per annum, but on the average of the six years following it to 15,500,000 lbs. (Bombay Report, page 36.) Nor does any falling off in transit in other quarters indicate that this was a mere transference of traffic to a new route. On the contrary, from the Return of 1847, page 382, it

The evidence of the superiority of the country under consideration, in relation to the production of cotton, lies in the fact that it has always supplied that article largely to the rest of India, and on terms to the grower which have permitted it to be charged with very heavy costs of carriage to the points where it had to compete with produce of other quarters.

The European demand for the cotton cloths of Bengal, which followed on our virtually acquiring the government of that province in 1759, occasioned there a great increase in the demand for raw cotton. *This material had formerly been obtained from Surat;* but in 1783 the first importation was made from Mirzapore of cotton, probably the growth of Bundelcund and of the Doab of the Ganges and Jumna¹. The cheapness of this cotton, together, apparently, with some interruption in the supply from Guzerat, occasioned, probably, by the then disturbed state of Western India², seems to have given to Mirzapore so great a superiority that the supply from Surat had ceased for some time previous to 1789³. Although the cotton thus passing Mirzapore as the principal or only foreign supply of Bengal, consisted at first chiefly of the produce of Bundelcund and the Doab, yet in 1789 that of Nagpoor and Amrowtee⁴ held the

appears to be an actual increase of product and of traffic: for while the cotton despatched for export from Bellary to Cuddapah in 1839, the year previous to the opening of the road, amounted to but 90,000 lbs., it reached in 1841-2 3 an average of more than 7,000,000. If the opening of railways into the interior from Bombay were followed only with effects like those of Bellary derived from a common road, and that not even continued to the coast, England would derive from one-quarter to one-third of her supply from the interior of India, instead of only one thirtieth, as at present.

It should be added that some other efforts have been made by the Government of Bombay to improve the transit across the Ghauts, in the southern part of that Presidency, since the tables were compiled of which the results are given above. A road made by Capt. Del Hoste up the Phonda Ghaut is likely to be very useful.

¹ Reports and Documents, 1836, page 338.

² At that time the chief cotton districts of Guzerat were the seat of war between native princes.

³ Reports and Documents, 1836, page 352.

⁴ Oomrawutty, often called, in these early accounts, Amsowtie.

first price, and constituted two-fifths of the quantity¹. Considering the length of the land carriage from Nagpoor to Mirzapore, 450 miles, and the great costliness in those disturbed times of that mode of transit,² it appears certain that to compete successfully and permanently, as it did, with the produce of Surat, conveyed to Bengal by sea, and with that of Jalown carried to Mirzapore only 250 miles by the Ganges, the natural capabilities of Berar must have been very superior, and its cotton must have been produced very cheaply².

To the eastward, as we have seen, this country supplied the manufactures of the Northern Circars. To reach this destination the cotton of Nagpoor must have travelled by land 400 miles; of which distance one-fourth, or one-third, lay in the dangerous jungle, and most disorderly country, which occupy the eastern part of the territories of the Nizam. The difficulties of this route were such as to contribute eventually to the cessation of the supply, and, together with the rivalry of British fabrics, to the suppression of this Indian manufacture. The price remaining after deduction of the probable cost of carriage, here again shows the great natural superiority of Berar. In 1800 the Government of Madras attempted to introduce the culture of the Nagpoor cotton into their own territories, by offering to purchase the produce, at first, at 3·68*d.* per lb., to be reduced after a time to 2·94*d.* per lb. From this price,

¹ Reports and Documents, 1836, pages 367 and 368.

² Cotton of Nagpoor sold at Mirzapore, in the period from 1786 to 1789, sometimes as low as 3·37 pence per lb. (Reports and Documents, 1836, page 368.) There is some reason to conclude, from the rates given by Sir John Malcolm many years afterwards as applicable to the troubled times which had commenced at the above date (Central India, ii., 370), that the cost of carriage by land, with insurance, was then often as much as 1*s.* per ton per mile. If so, the price of cotton in Berar could not have been much more than 1*d.* per lb. The price at Jalown, and other places on the Jumna, from 1796 to 1802, were from 1·8 to 2·3 pence per lb. (Reports and Documents, pages 16, 23, 27.) Again;—the price of cotton in Baroche in 1789 was from 2·58 to 2·87 pence per lb. (Reports and Documents, 1836, page 10), at which rate, when carried by sea to Bengal, it could not compete (although equal in quality) with Nagpoor cotton carried 450 miles by land and 500 more by river navigation.

duly diminished by the cost of a most hazardous journey of 400 miles, it may again be inferred that the price in Berar was not much above 1*d.* per lb.

Southward, Mysore, and the western coast in the same latitude, were supplied, at the time of Dr. F. Buchanan's visit in 1800, from the Doab of the Kistna and Toongbuddra, from Dharwar, and from Bellary. Cotton from these districts was consumed by the manufacturers of Bangalore; it was also forwarded in the course of commerce towards the south by the *trading towns of Sira and Devanagiri, and to Mangalore by the merchants of Hyder Nagara.* The price at Bangalore was 3·32*d.* per lb.; the duties on the road 0·44*d.* per lb.; and carriage, at the rate of 10*d.* per ton per mile, which seems not to have been unusual, came, on a route of 240 miles, to 1·08*d.* per lb. That the profit was high seems certain from the risks occasioned by the state of the country. Merchants were often robbed of their goods in transit. When this was done by private thieves, the Government made good the damage, as part of the service for which it took transit duties; but when, as often happened, the violence was done by armed bodies, stationed by the Government itself for the purpose, the merchant bore the loss¹. Under these circumstances, the amount of 1·8*d.* per lb. left to the merchant out of the price at Bangalore, after expenses paid, could not allow much more than 1*d.* or 1½*d.* per lb. for the original cost in Dharwar.

Finally, to the westward, this tract of country formerly exported cotton by way of Surat², and there is reason to suppose that notwithstanding facilities afforded by the opening of the Thull and Bhore Ghaut roads, for adopting the less indirect routes to Bombay, this practice has ceased but lately, if at all: for Mr. Fenwick, writing from Kunhur in 1840, to the Agricultural Society of Bombay, says "I have also ascertained that cotton will not be carried to Baroche or Surat *this year*;"

* ¹ From various statements in Dr. Buchanan's Journey from Madras through Mysore, &c. "

² Sir John Malcolm on the Government of India, page 107.

and the Report of the Bombay Committee, in 1847, page 13, states that, "Candeish cotton is sometimes sent down by the Comdabarree Pass, into the Surat Collectorate, and thence by sea to Bombay." Now since the cotton of Berar is not materially distinguishable in quality from that of Surat, it must be exported at a price much like that of the latter, and consequently its price in the interior must be as much lower than that of cotton grown near the coast, as to counteract the cost of its 300 miles of land carriage.

These conclusions, confessedly not of the most rigorous character, comport well with all information as to the prices of cotton in this great central region at different periods; and I apprehend they go far towards showing that the great natural adaptation of this part of India for the growth of cotton, in whatever that adaptation may consist, has always enabled it to supply many other countries, both for domestic use and for manufactures, notwithstanding the cost and peril of long inland journeys, during, perhaps, the worst period of the violent and changeful history of India.

It is not difficult to define the country to which these conclusions apply. On the west its boundary would be found at 30 or 40 miles eastward from the great Western Ghauts; for I omit the successful effort of Mr. Dickinson, at Jooneer, because it was due to irrigation, which it is contrary to my present argument to count on¹; nor do I include the earlier successful attempt of Dr. Lush, in 1830 or 1831, at the botanical garden, Dhaporie, near Poona, for too little is said of it for guidance². But I admit the large growth of Bulwunt Singh at Ahmednuggur, in 1830 or 1831³, sold in London at 5½*d.* per lb., nearly the price at the time of ordinary and middling American⁴. Indapoor and Dharwar lie within the boundary I have adopted.

The opposite boundary is necessarily formed by the jungles

¹ Transactions of the Agri-Horticultural Society of Bombay, July, 1843, page 49.

² Reports and Documents, 1836, page 212.

³ Ibid., pages 186 and 212.

⁴ Sir John Malcolm on the Government of India, page 125.

which cover the eastern parts of the Nizam's dominions, beyond which, eastward, are the Khond country, (yet very imperfectly known,) and the Northern Circars, which have before been shown to produce little or no cotton. • The northern and southern limits require more detailed investigation.

Mr. Mercer, disappointed in the climate of Bdunelcund, and the results of cultivation there, had expressed a strong opinion in favour of the cotton-producing power of Berar, founded on a sample of its produce, which had been sent to him¹. Being placed at the disposal of the Bombay Government, he was directed to observe, on his way to that presidency, the circumstances affecting, in different places, the growth of cotton. His route was from Mirzapore, by Rewah, Jubbulpoor, Hoshungabad, Baitool, and Luckenwarra². Avoiding details, his remarks are as follows. Between Mirzapore and Jubbulpoor he found little cotton grown; and in two instances, of which he gives particulars, the value of it was, in one case, 3 rupees out of 11½ less than that of Oomrawuttee, and in the other, the quality was equal but to that of the poorest growth of Bundelcund. Only of a short distance in the southern part of the valley of Mayheer is any more favourable account given, and even here the local cotton is classed, though not all alike, with that of Bundelcund. From this valley to Jubbulpoor itself, although he met droves of bullocks passing through with Nagpoor cotton for Mirzapore, and although the country was in one place "very luxuriant," and for three days' march "beautiful, and generally highly cultivated," yet there were "no cotton fields." Leaving Jubbulpoor, he found the country more decidedly "of a cotton character;" but he did not find much cotton cultivation, and only in the neighbourhood of Hoshungabad is cotton noticed as a crop apparently deemed important by the cultivators, while even this importance again disappears in the journey to Baitool.

Arrived, however, at Luckenwarra, on the Adjunta or Nyhadree Range,—that is, having crossed that part of Berar

Return of 1847, page 138.

² Return of 1847, pages 215 to 219.

which lies to the northward of that range,—he writes that in one part “cotton seems to be the chief cultivation,”—“half the crop,”—that “generally there is an approach to American cultivation, such as he had seen nowhere else in India,” and speaks of the native cotton as “being already of a superior character.”

On his way he met considerable quantities of Oomrawuttee and Hingenghaut cotton proceeding to Mirzapore. He states that he found the Oomrawuttee “of very good colour, fine, soft, and though uneven, of pretty good length and strength,”—“better, he thought, than fair Americans;”—that from Hingenghaut, “of very good quality indeed;”—that from Arvee, “very good, just the same as all the Nagpoor cotton he had seen, of fair length and fineness, colour excellent, and, if a little better cleaned, certainly equal to good Mobile, or Upland Georgia, with none of the harshness so common in the cottons of the north-western provinces” of India.

The general result of his judgment seems to be, that, while in the northern part of his journey he found little or no encouraging present growth of cotton, yet, that so soon as he reached Berar, he perceived a change of circumstances highly favourable to the purpose,—that cotton is largely grown there, that the cotton of Oomrawuttee is at least equal in nature to the fair common qualities of American,—and that the cotton of Hingenghaut is superior by about 10 per cent. to that of Oomrawuttee. These conclusions are in exact accordance with all other testimony, but have here the peculiar value of being the opinions of an experienced American planter, sent out by the East India Company, to improve the cotton cultivation of India.

The country to which these remarks apply is approximately defined by a line passing from east to west a little south of Baitool. This line, continued westward, would take in but little more of Candeish than is now growing, and exporting cotton to advantage, while, perhaps, the whole northern limit, thus laid down as a convenient straight line, may, perhaps, exclude

some small districts, as the Nerbudda, which under improved circumstances of transit, could contribute to our supply¹.

The southern limit includes Bellary. On the west it is marked by the Wurda River, (a tributary of the Toongbuddra, and through it of the Kistna,) southward of which all testimony agrees that no good cotton is grown, although immediately to the northward of it is the celebrated cotton district of Dharwar. On the east the line approaches the Kistna, near Kurnool. Cuddapah, to include which would have made an irregular and uncertain line, may be considered an outlying portion of the figure so defined, that district and Bellary contributing to the export chiefly through the port of Coomptah, as has been already noticed². The high land of Mysore, which commences immediately to the southward of these limits, is too well known to produce no cotton, to permit the boundary to be carried further in that direction.

The limits of the great cotton field of this part of India being thus pointed out, it remains to be seen whether the area so comprehended is, or is not, generally applicable to the purpose. With this view I proceeded to enumerate the places within it, which supply cotton for export by way of Bombay: for as the cotton of that port is sent indifferently to England and China, and little or none is rejected as unfit for the English market, I apprehend that it will be sufficient to show what parts of the country send approved cotton to Bombay. This argument is, I believe, only subject to the remark that, generally speaking, the indigenous cotton grown in the northern, and particularly in the north-eastern portions of the area now defined, is better than that produced in the southern parts of it: but the latter is not so inferior as to cause its rejection.

The following table exhibits the chief centres of districts

¹ It is right to remark, in passing, that the cultivation of the better varieties of the plant is now extending considerably in Candeish; its progress there has at present the encouragement of Mr. Alexander Elphinston, now Collector of the district, whose remarkable efforts and success at Rutuagheery have been already noticed.

² Page 47, note.

Names of Places.	Lat. N.	Long. E.	Authorities.
Ellichpoor	21½	77½	Report of Bombay Committee, Return of 1847.
Nagpoor	21½	79½	
Arvee	21	78½	
Hingenghaut	20½	79	
Chandah	20	79½	Mr. Fenwick.
Woonee	20½	79	
Ralygaom	20½	78½	
Oomrawuttee	21	77½	
Khamgaum	20½	76½	Report of the Bombay Committee.
Mulcapoor	20½	76½	
Candeish, various districts chiefly to the south and east of the Girna River	20½ to 21	74 to 75½	
Kondewarree	18½	77½	
Kum Kaolee, probably Kowlas	18½	77	Report of the Bombay Committee.
Nandair	19	77½	
Buswunt	19½	77½	
Ahmednuggur ¹	19½	74½	
Nizam's country, districts to the eastward of Wyraj and Barsee	18½	75½	Report of Bombay Committee, page 55.
Bheemthuree pergunnah	18½	74½	
Indapoor	18	75	
Sholapoor	17½	76	
Shorapoor	18½	76½ ³	Letter of Collector of Poona to Revenue Commissioner, 23 Oct., 1841 ² . Bombay Report, page 55.
Belgaum	16½	74½	
Dharwar	15½	75	
Bellary	15	77	
Cuddapah	14½	79	

¹ Possibly Nassick might have been included "When Government, in August, 1835, issued orders for land to be free for five years, 8000 beegas were grown by the ryots in 1837: when the home Government ordered this to be discontinued in 1838, not one beega was sown, because the tax on the land was too high."—*Answers of J. C. Grant, Esq., to the Agri-Horticultural Society of Bombay, 24th Dec., 1839.*

² Proceedings of Agri-Horticultural Society, Bombay, 1843, page 47. "A superior quality of cotton, which fetched a high price at Bombay," was raised, apparently, by a native.

³ Letter from Capt. Meadows Taylor, in charge of the district, dated July 13, 1846. Extract:—"In regard to cotton the export" (from Shorapoor) "appears inconsiderable in comparison with the produce; but a great deal is consumed in the country in local manufactures, and much spun into fine and coarse yarn, for export to various places around, of which it is impossible to obtain any account. This yarn is sold by the poorer classes, who spin it, at village markets, within and without the

which have supplied acceptable cotton to Bombay for England, and which, with one or two exceptions, continue to supply it; it will be observed that they are distributed nearly over the whole of the area marked out. The south-eastern portion, however, too distant from Bombay, has, I believe, a traffic in cotton with Wallahjahnuggur, near Arcot, for export by Madras: some years ago I found this trade described in some papers at the India House, the trace of which I cannot now recover.

An inspection of the map will show that the area described is so occupied with the districts of which the places here enumerated are the centres, that a calculation may fairly be applied to the whole, as to the quantity of cotton, fit for English use, which may be derived from this source. The four angles of a quadrangle which may nearly represent this area are situated as follows:—

	Lat. N.	Long. E.
N.W.	21°	74°
N.E.	22°	79½°
S.W.	14½°	75½°
S.E.	15½°	79°

The area thus defined, with a small addition for the outlying districts already mentioned, may be taken as about 450 miles from north to south, with an average breadth of 300 miles from west to east, the gross surface being, therefore, 135,000 square miles. If one-half of it is occupied by mountain ranges, sites of towns, beds of rivers, and unsuitable soils, the other half

boundaries of Shorapoor, and to a great extent. It is only recently that cotton from the Shorapoor districts had gone, in any quantity, to Solapur for the Bombay market; and as the whole of the districts are extremely well adapted for its cultivation, I have no doubt that, with increased facility of communication and transport, the amount would be very materially increased. The Shorapoor cotton at present bears a low price, and the expense of its transmission renders profitable export very doubtful."

* * * * *

"The districts to the south of the Kistnah, bordering on Shorapoor, in fact the whole of the fertile tract situated between the Kistnah and Toongbuddra Rivers, has at present no adequate market for its produce. The cultivators and merchants sometimes send cotton to Solapur for sale, as it is produced in large quantities, and some finds its way to Dharwar and Belgaum. But the distance it has to go, and the expense attendant upon the transit, render profit very uncertain."

contains 67,500 square miles, or 43,200,000 acres, applicable to the growth of cotton fit for English use. If one-fourth of this were cropped every year, and the produce were equal to the average of Guzerat and Candéish, or 100 lbs. per acre, the weight of the whole crop would be 1,080,000,000 lbs. per annum, or $2\frac{1}{4}$ times the entire quantity annually consumed by the manufactures of Britain, on the average of the 13 years ending in 1846.

But Indian cotton, of the quality at present supplied, is not suited to more than 75 per cent. of our manufactures,—that is, we could take from India only 360,000,000 lbs. per annum out of the 480,000,000 lbs. we now work up; so that this part of India alone, being probably capable of producing 1,080,000,000 lbs. per annum, could grow for us three times as much as we could take, and could therefore amply and fully stock us, even if we had no other source of supply, except for the very fine varieties required by a small part of our manufactures.

It is by no means, however, with a view to urging sole dependence on this area, that I thus exhibit what appear to me to be its great capabilities. A single source of supply of cotton is dangerous by its very singleness, whether it be situated in India or in America, or in any other part of the world. But I apprehend that the great excess of capability to meet our wants, on their present scale, which is here disclosed, affords much more than reserve enough to compensate for any possible error of fact or argument, or to adapt the supply hereafter to any expansion of our requirements: and it is certainly a startling matter, that, from a country which might send us cotton enough to render us perfectly safe against the consequences always apprehended, and often felt, of a contraction or failure of the American supply, we now receive at most but five per cent. of our consumption.

The remaining point, which my further arguments require to be established, is the price at which cotton can be bought from the cultivator, at the various places within this area. The following table will sufficiently illustrate this point:—

Places.	Date.	Price.	Remarks.	Authority.
Nursingpoor, lat. 22½, long. 78½	1843	Pence per lb. 1.56	To the north of the specified area.	Mr. Mercer. Return of 1847, page 216.
Chulea . . .	1843	1.50	Ditto.	
Hingenghaut . .	1843	1.68		
Chaudah . . .	1817	1.17 ¹		
	fr. 1817 to 1821 was once	to 1.26 2.93 to 12.26 16.68 1841		
Khamgaum, in Berar . . .	1836	2.30	Factors' prices.	Letter of Mr. Fenwick to Agri-Hort. Soc. of Bombay, &c
	1839	to 2.88		
Ditto . . .	1841	1.32		
		1.72		
Ditto . . .	1842	to 2.12		
		1.58		Mr. Fenwick. Letter to J. Chapman, 21st August, 1846.
Ditto . . .	1843	to 2.14		
		1.39		
Ditto . . .	1844	to 1.44		
		1.58		
Ditto . . .	1845	to 1.85		
		1.44		
Ditto . . .	1846	to 1.59		
		1.25		
Candeish . . .	1847	to 1.45		
		1.84	Price to culti- vator.	Mr. Blount. Letter to Mr. Young, 26th Feb., 1847.
Barsee . . .	1847	1.99	Bazaar price.	Mr. Coles. Report of Bombay Committee, page 55.
		to 2.29		
Sholapoor . . .	1847	1.99	Bazaar price ; often brought great dis- tances, and sold through middle men.	Mr. Coles. As above.
		to 2.49		
Shorapoor . . .	1846	1.19		Letter of Capt. Meadows Taylor to J. Chapman, July 3, 1846.
Belgaum . . .	1844	3.28		Mr. Inverarity. Report of Bombay Committee, page 58.
	1847	1.64		
Dharwar . . .	1843	1.28 ²		Mr. Shaw. Return of 1847, page 495.
	1846	1.61 ³		Return of 1847, page 517.
Guduc(Dharwar)	1843	1.08		Mr. Shaw. Return of 1847, page 490.

¹ "In the year 1817 we purchased cotton at Chaudah at the rate of 14 and 15 rupees the pullah of 120 pukka seers of 80 rupees weight each" (1.17 and 1.26 pence per lb.), "and sold it at Coringa at an advance of 200 per cent. From that period to 1821 it fluctuated from 35 to 150 rupees" (2.93 to 12.26 pence per lb.), "and

Bearing in mind that many of these prices are greater than those received by the actual cultivator, it can hardly be too much to affirm that cotton was had, or might have been had, at almost any place within the area designated, and at some beyond its limits, at prices varying from $1\frac{1}{4}d.$ to $1\frac{3}{4}d.$ per lb. The price of the same article in England, during the same period, has varied from $3d.$ to $4\frac{1}{2}d.$ or $5d.$ per lb. The practical question to be discussed is this—What has prevented the cotton of India from being sent to England under the operation of those prices?

once was 200 rupees the pullah" (16·68 pence per lb.). "This was owing to a very large quantity having been burnt at the taking of Chandah" (by the British, in May, 1818), "and the distracted state of the country some time, and two successive bad crops. The price, I believe, has come down to the old standard, which was seldom more than 20 rupees" (1·67 pence per lb.), "but often under it."

* * * * *

"For the extension of the cotton cultivation in the Wurdah districts, we advanced money to the ryots to set themselves up with ploughs, cattle, and other implements of husbandry, and to feed them for the year. Upwards of one lack of rupees was advanced the first year we commenced our operations there, and the pergunnahs of Woonce and Ralygaom" (in the Nizam's dominions), "and some smaller ones, from a waste sprung up as if by enchantment. The cultivations were extended to an unexampled degree; almost every village in these pergunnahs was taken up, many of them, indeed most of them, previously deserted. Thousands of ryots flocked to their homes, which they had abandoned to avoid extortion and oppression, which they could support no longer. The villages were given out in Ijarah" (that is, the revenues let in farm), "in preference to former patells, where they were forthcoming, for a term of five or seven years; and, in short, in four years' time the revenues were raised from 50,000 to 150,000 rupees, the country at the same time rapidly improving." * * * "This district had an advantage; the inhabitants had only fled across the river" (into the Nagpoor territories), "from the oppression of the Nizam's aumils, and returned as soon as assured of protection under Messrs. Palmers' operations."

(Signed) "R. H. FENWICK."

² Mr. Shaw remarks that the ryot, having mortgaged his crop at the rate of 25 per cent. to the purchaser, does not get above 0·94 pence per lb.

³ The price given by Government as an inducement to the growing and superior cleaning of Orleans cotton. From an uncertainty as to the weight (candy) referred to, it is not quite certain whether this price should be 1·61 or 2·26 pence per lb.; probably the former.

CHAPTER III.

CAUSES OF THE INCREASE OF THE EXPORT OF COTTON FROM INDIA TO ENGLAND UP TO A CERTAIN PERIOD, AND OF THE CESSATION OF INCREASE FROM THAT TIME.

THE question, as left at the close of the preceding chapter, is this—How happens it that, with proved and most abundant capability of growing cotton in central peninsular India, at $1\frac{1}{4}d.$ to $1\frac{3}{4}d.$ per lb., we receive so little of it, although we give from $3d.$ to $5d.$ per lb. for this very article at Liverpool?

It seems to me to be of great importance to practical success, that we adhere closely at present to this simple form of the inquiry, without being diverted from it by other subjects, which are doubtless of vast importance, but which cannot be effectually dealt with until some previous changes have been accomplished: and it will be observed that the question of price really includes, for our present practical purposes, the effect of all others. Whatever the soil, whether garden mould, cotton soil, red soil, or even brick dust, or cast iron—whatever the climate, whether moist or dry, stormy or quiet, certain or uncertain—whatever the implements or processes of agriculture, whether rude or refined, of little avail or effective—whatever the government, whether strong or weak, violent or mild, efficient for protection, or itself the greatest robber, British or native—whatever the land-tax, whether equally, honestly, and moderately assessed, or a mere legal name for extortion, limited only by evasion or resistance—whatever the supply of capital, whether plentiful, on equitable and considerate terms, or on such

conditions as to convert it into a mere engine for forcing from the cultivator the fruits of his exertions—whatever the supply of labour, whether abundant, intelligent, willing, hopeful, and energetic, or scanty, uninterested, and depressed—whatever the demand for cotton, whether constant and encouraging, or fitful and of little influence—still the fact remains, as the actual result of the sum total of the circumstances which have existed, and do exist, that cotton *acceptable in England* can always be had in the large markets of the country between the Kistna and the Nerbudda for $1\frac{1}{4}d.$ or $1\frac{3}{4}d.$ per lb.

And further;—whatever the condition of the Indian cotton, whether clean or foul—whatever the character of its fibre, whether soft or harsh, long or short, even or uneven—whatever its quality compared with American, whether equal or vastly inferior—whatever the pressure or lightness of the competing supplies—still the price it obtained in Liverpool was from $3d.$ to $5d.$ per lb.; and this price must have been so adjusted in relation to that of American cotton, as at once to afford the gauge of its inferiority, and to compensate for dirt, shortness of staple, and any other ill quality the cotton of India had, or can be supposed to have had.

The argument which I purpose to base on these prices will not be much affected, I conceive, by any probable changes of a merely economical character in India. If the measures hereafter taken should increase the demand in India, the price there cannot rise so materially as to check the demand, or render the future prices very different from the past, if only sufficient means of transit for goods and persons be established, so that local capabilities may readily meet with the means of being brought into action; for in every district there are large tracts of uncultivated land, equal to that which is cultivated, and everywhere there is abundance of unemployed labour. Although, therefore, no doubt, fluctuations with a tendency upwards would at first take place, and would, in fact, supply, in part, the needful stimulus to extension, the permanent effect of an increased demand could only be to bring the capabilities of the natives

and of their country into greater activity, and not, for a long time to come, to raise the price of the produce¹.

Nor does my argument in any degree overlook the great importance of improved culture, improved kinds of cotton, improved fiscal regulations, improved government, improved artizanship, or any other of the vast and varied amendments which must, in future, bear an intimate relation to this subject. I merely purpose to show that the first steps safely *may* be taken, and practically *must* be taken, on the basis of the present condition and supply of Indian cotton. My view is, that to make Indian cotton, and India itself, what we wish them to be, we must first deal with them as they are.

Returning then to the question—Why, under the influence of such prices as have existed, has no more Indian cotton been brought to England?—I purpose, before entering on the direct answer, to show by what gradations and means, the supply from India has reached its present magnitude, believing that the facts of the past, in this case, afford the best available insight into the probabilities of the future.

In the middle of last century our growing connection with India brought cotton fabrics into more general English use, to

¹ Two points tempt discussion, but they are too remote from the direct object of the present inquiry to permit more than passing notice. An increased demand for cotton would necessarily work a change in the revenue system of the Nizam's dominions. Most likely, at first, the authorities and their contractors would attempt to secure all the advantages arising from the increased demand; the resistance to this attempt, in its usual form, would consist in emigration to the British and Nagpoor territories, until their capabilities were filled up, or the Nizam's system amended. Meanwhile the operation of the struggle could not greatly impede the gradual increase of our supply.

The other point relates to the permanence, or otherwise, of the present rate of wages in India. We are in the habit of taking it as an ultimate fact, not to be further inquired into, that the Hindoo is content to work for 2*d.* or 3*d.* per day. Why he is so content, and what change of contentment new circumstances may bring about, we do not ask. I have seen the inhabitants of a Ghaut village far too sensitive to the possibility of a better bargain to permit any doubt of their being under the influence of the ordinary motives of humanity. I omit, however, further notice of this subject under a belief that any possible change will be too complicated in its causes, and too slow in its progress, to affect our present questions.

the invasion of our ancient wont of linen and woollen. In 1769, Arkwright, whether by the genius of an inventor or of an administrator, or of both, gave existence in England to the means of spinning more cheaply than Hindoos, with fingers of hereditary dexterity, and wants of tropical scantiness, could accomplish the task. Cotton to supply the new manufacture was obtained from several sources, none of which, nor all put together, could have kept pace with the gigantic growth of the demand in these latter days. In 1793, America, which for three years previously had sent us its first little growth, acquired, in Whitney's saw gin, the means of removing the chief obstacle to that rapid extension of its commerce in cotton, which has had in it so much to benefit both that country and England, and to give a lesson to the world¹. Previous, however, to that year, the attention of the Court of Directors was turned to the subject, and they directed their servants in India to pursue inquiries, and to take measures, which have been continued, with whatever effect, from that day to this.

During most of the long years of war which followed, America had the advantage of being a neutral power, and therefore of navigating the seas in safety—an advantage of which India was deprived through its connection with England. So serious was the consequence, that from the numbers and boldness of the French cruizers and privateers in the Indian seas, and from other like causes, freights in 1811 had reached 22*l.* per ton, equal, on a measured ton of 1375 lbs. of cotton, to 4*d.* per lb.

More even than this:—India, ever since the rise of the English demand for cotton, had suffered an unusual aggravation of her chronic intestine evils. Not only did national war rage between her different states, but powers essentially predatory in their constitution overran her fairest regions, while even immense bodies of armed men, organized avowedly only for purposes of plunder, sunk her to still lower depths of bitter suffering and desolation. In these calamities the great cotton-

¹ Commercial Tariffs, Part xxiii., page 484.

growing countries of India fully participated, while America was not only enjoying all the advantages of peace, but was daily receiving the most important accessions of strength and skill, in the emigrating thousands who found, or thought, the old world unsuitable to them. It was not before 1807 that the Embargo Act, passed by the Legislature of the United States, first interfered with a state of things so favourable to the growth of the American export of cotton, and not until 1812, nearly twenty years after the invention of the saw gin, and the rise of the American cotton trade, that the war put an interruption of a couple of years to this remarkable progress.

Nor, although the facts already enumerated seem enough to account for the event, should it be forgotten that, while the trade of the United States was under the stimulating guidance of individual interest, that of England was in the hands of an exclusive, or at least, a controlling corporation. However such an institution might be in accordance with the views of statesmen, and even with the public feeling of those days, few will now deny that its inevitable tendency was to cramp, and limit, and regulate a trade which had a rival in the interests of the most enterprising and self-relying people on the face of the earth. Whatever was adverse in the condition of India was aggravated, in a measure, by the restraints which we, in our wisdom, put upon ourselves.

The effect of the very different situations of India and America was to repress the export of cotton from India to England, and consequently, also, the growth and improvement of it for export. From the beginning of the demand in 1780, to the American embargo in 1807, the quantity received in England from India reached, in the most favourable year, 1799, a highly exceptional one, to only one-sixth of our total imports, while in the greater number of years it amounted to the merest fraction, and in some there was none at all; on the average of this period the imports from India amount to little more than one twenty-fifth of the total import, or one-tenth of that supplied

by the new industry of America¹. It was only under the pressure of the loss of the American import, from war, that that from India rose above this low level; and in 1809, 1810, and 1811, large shipments took place, chiefly, however, of a speculative character, and leading to great loss from the restoration of the old supply; but, even when most stimulated, the receipts from India never reached to a sixth of our total imports, or to *a third of the supply from America. Immediately after this effort it fell even below its former standard, and in 1813 became* nearly extinct; in the last-mentioned year, indeed, no cotton whatever was shipped for England at Bombay².

But from this year, 1813, the improvement, with indeed some intervals of depression, has been marked and permanent; and the proportion of Indian cotton received in England, to that from other quarters, which was established within a few years of that date, has been maintained, on the whole, throughout the period. I propose, therefore, to take 1813 as the date of the practical origin of the Indian export, as 1793 is assumed for that of the American, and to inquire into the rate and causes of the increase from that time.

The first remarkable fact is, that our import from India has increased since its virtual origin in 1813, with a rapidity not very dissimilar to that from America, in the same number of years following 1793. Taking the four years from 1842 to 1845, both inclusive, (so as to avoid on the one hand the year 1841, when the closing of the China market threw an ad-

¹ Reports and Documents, 1836, parts xv, and xvi. Commercial Tariffs, part xxiii., p. 484.

² The only other remarkable event in relation to this subject, which need be noticed, is the large occasional exports from Calcutta after the peace, which were not successful, and which have been succeeded by almost a cessation of the trade. Extravagant prices were given in Calcutta, under the stimulus of the demand for cotton in England which followed the restoration of peace, the value and permanence of which stimulus there had been no previous experience to show. To such an extent did it operate, that Bengal cotton was, for several years, carried to America to be employed in adulterating the cotton of that country.—*Wilson's External Commerce of Bengal*, page 24.

ditional quantity on England; and on the other, the year 1846, one of peculiar depression from drought and other causes) our average import from India was 73,500,000 lbs. per annum; that from America for 1822-25 (the same years relatively to 1793) was 118,000,000 lbs.¹ In viewing this as some indication of the relative capability of India to grow cotton fit for English use, it must be remembered that the American growers had hardly any rivalry to keep down their export, while the export of India had to rise against the powerful and practised opposition of America, already in chief possession of the market—that America was within a distance of England short and easy in comparison with that of India—that American cultivation was often upheld and extended by the direct aid of English capital, an advantage never enjoyed by the cotton cultivation of our eastern fellow-subjects—and that mechanical and scientific aids of all kinds were at the command of America, but not at the command of India. Notwithstanding these great advantages on the side of America, she overran India, in 20 years, only in the proportion of 118 to 73½.

The export of India, like that of America, has been extended in the face of continually falling prices. In 1813 the price of Surats at Liverpool was from 1s. 3½d. to 1s. 8d. per lb.; in 1820, from 6¾d. to 1s.; in 1824, from 5½d. to 8d.; in 1830, from 3d. to 6d.; in 1840, from 4d. to 5d.; in 1845, from 2½d. to 3¾d., and in 1846, from 4½d. to 6d.² Notwithstanding the fall which, with oscillations indeed, has prevailed from the beginning, the import has reached an average of between 60,000,000 and 70,000,000 lbs. per annum.

This increase, I believe, is not to be ascribed to any improved quality or condition of the article. It is admitted on all hands, that the early imports of Indian cotton were at least equal in these respects to the latest, and the complaints on these points, in respect of the indigenous cotton of India, are as loud now as they ever were; it is also worthy of remark

Burn's Cotton Statistics, Table 17.

² Burn's Cotton Statistics, pages 21 and 22.

that the import of the cotton of India, with all its hereditary and unmitigated faults, has risen so high, against the constantly-improving produce of America.

Nor has this commerce risen in consequence of cheaper production in India; for a comparison of prices, at different years, *will show that no such variations of price have taken place as can account for the effect, or as bear any considerable proportion to other causes.* It is true that, at the beginning of the period, the interruption of our commerce with America did occasion in India, not only great attention to the subject on the part of the authorities, but, for a time, a very considerable rise of prices in the few districts which were accessible to the increased demand. This advance of price does not seem to have been the cause of a permanent increase of supply, except, perhaps, to some extent in Guzerat; or indeed to have reached the interior of Peninsular India at all. Mr. Fenwick bought cotton at Chandah, in 1817, at $1\frac{1}{4}d.$ per lb., a rate which was only enhanced afterwards by local and violent causes, and which was subsequently again established. Nor, amongst the notices of price of cotton in the district I have defined, is there any trace of a price, in ordinary times and in ordinary traffic, from that period to the present, higher than about $2\frac{1}{2}d.$ per lb., while it has commonly varied during the whole period between $1\frac{1}{4}d.$ and $2d.$ The ryot now receives for his cotton a price not very different from, certainly not less than, that he obtained while native governments ruled these parts of India without British supremacy, and before the setting in of the English demand for the staple¹. We have, therefore, not to look here, as we may in America, for increased cheapness of production to account for increased capability of exportation, at least in respect of the part of India more particularly under consideration.

¹ A complete discussion of this subject would require a mass of details which would too much interrupt the argument. The demand from England raised the price temporarily in Bengal, in Guzerat, and in the southern territories of Madras. This advance took place at different periods in each of these districts, and has been followed by a return to the ancient prices, without leaving any considerable permanent effect behind it, except in the increased cultivation of Guzerat.

The causes to which we may attribute the increased power of export, in the face of diminishing prices in England, are, I believe, those which affect the costs incurred in the operations equisite between the grower in India and the spinner in England, and they are, I think, the following:—

- 1st. The fall in freights;
- 2nd. The fall in exchange;
- 3rd. The pacification of the country, and the consequent diminution of the danger and cost of carriage within India.
- 4th. The change of route, by which the cotton is more cheaply carried to the sea.

The two first items, which are also those that affect transactions as between India and England, require but brief notice.

1. *Fall in Freight.*—The year 1813, which witnessed considerable diminution of the dangers of maritime commerce in the East from war, was soon followed by the great European peace. The chief causes of the excessive rates of freight accordingly ceased to operate, and the long-discouraged enterprise of England soon sought fields of occupation in the commerce of India, then partially further opened by the modifications of the exclusive trading privileges of the East India Company. The consequences are seen in the following table of freights.

Date.	Rate per Ton.	Rate per lb. of Cotton ¹ in pence.	Authorities.
1811	£ 25 0 0	4	War. Reports and Documents, 1836, page 41.
	30 0 0	.....	Letter of F. Carnac Brown, Esq., attached to the Memorial of the Merchants of Cochin, page 57.
1813-14	14 0 0	2.44	Wilson's External Commerce of Bengal, page 47.—From Calcutta.
	to 16 0 0	to 2.79	
1818-19	7 0 0	1.22	Wilson, page 16, "the highest rates given"—"lower by 60 or 70 per cent. than for the previous twenty years."
	to 7 10 0	to 1.31	
1826-27	4 0 0	0.70	Wilson, page 47.
	to 6 0 0	to 1.05	
1830	.....	1.000	Loose estimate by Court of Directors. Rep. and Doc., 1836, page 181.

¹ Taken at 1375 lbs. of cotton to the ton of 50 cubic feet, a rate which seems to have existed earlier than 1832 (Reports and Documents, page 207), and is in use at the present time.

Date.	Rate per Ton.	Rate per lb. of Cotton in pence.	Authorities.
1832	£ s. d. 5 15 0	1·00	Actual freight. Rep. and Doc., 1836, page 207. Ditto, page 208. Assumed by the Court as probable, pages 219, 220, and 221.
	8 10 0	1·48	
	7 0 0	1·22	
	8 0 0	1·39	
	9 0 0	1·57	
1839	4 0 0	0·698	From the Price Currents of the Chamber of Commerce of Bom- bay.
to	5 10 0	0·959	
1840	3 5 0	0·567	
to	6 5 0	1·090	
1841	3 10 0	0·611	
to	5 5 0	0·915	
1842	1 10 0	0·262	
to	3 15 0	0·654	
1843	1 10 0	0·262	
to	2 15 0	0·480	
1844	2 5 0	0·393	
to	4 0 0	0·698	
1845	2 15 0	0·480	
to	4 5 0	0·741	
1846	2 0 0	0·698	
to	4 0 0	0·349	

The foregoing table, it will be observed, employs, in the earlier period, for want of better information, a few rates of freight from Calcutta; it is believed, however, that they may be applied to Bombay without material error.

Leaving out of account the war rate of 4*d.* per lb. or 25*l.* per ton in 1811, it cannot be too much to assume that in 1813, 1814, and 1815, freight to England from Bombay, cost 15*l.* per insured ton of 1375 lbs. of cotton, or 2·60*d.* per lb.: but the rate for several years previous to 1846, does not seem to be on the average much more than 0·6*d.* per lb., and was often much less. The fall in freights, therefore, I estimate at 2*d.* per lb.

2. *Fall in Exchange.*—Here again, for the earlier part of the period, I have to resort to statements strictly applicable to Calcutta, but no doubt practically true for Bombay also. The following table gives the rates of exchange in terms of the Sicca rupee, from Wilson's "External Commerce of Bengal;"

the additional column shows the corresponding value of the Company's rupee ($\frac{1}{16}$ of the former) which is now in general use.

	Sicca Rupee.				Company's Rupee.			
	s.	d.	s.	d.	s.	d.	s.	d.
1813-14	2	8	to	2	9	2	6	to 2 6·94
1814-15	2	9	to	2	10	2	6·94	to 2 7·87
1815-16	2	8	to	2	9	2	6	to 2 6·94
1816-17	2	7				2	5·06	
1817-18	2	7				2	5·06	
1818-19	2	6				2	4·12	
1819-20	2	6				2	4·12	
1820-21	2	3				2	1·31	
1821-22	2	2				2	0·37	
1822-23	2	0				1	10·50	
1823-24	1	11				1	9·56	

Since the last year in this table, the exchange has varied between 1s. 8½*d.* and 2s.¹; the fair average about which it has oscillated being, apparently, the bullion value of the Company's rupee, or 1s. 10*d.*; between this rate and that of 2s. 6*d.* for the same rupee which prevailed at the rise of the permanent export of Indian cotton to England, the difference is 8*d.* per rupee, or 33 per cent. on the value; which ratio applied to the probable export price at Bombay at that time, of 6·16*d.* per lb. enhanced that price to the English importer, by 2·21*d.*, rendering the real price in England, 8·37*d.* per lb., besides freight and charges. This whole augmentation of 2·21*d.* per lb. has now disappeared, and by so much are charges diminished under this head, in comparison with those of 1813-14. ¹

3. *The Pacification of India and the consequent Diminution of the Cost of Inland Carriage and Insurance.*—In 1813 India was afflicted with troubles, commotions, and desolations of extreme bitterness and severity. Chieftain against chieftain, prince against prince, were engaged in the struggles which followed the decline of the Mogul Empire, and the predominance of the Mahratta power; while from the bands of

military mercenaries, alternately employed and destitute, which this state of things produced, sprang those terrible devastators, the Pindarries, and even these were recruited from the very cultivators whom their monstrous excesses had driven from house and field. Individual security was at an end; law and right were often powerless in even the least afflicted parts of the country. Only by the fall of the Peishwa, the subjugation of the Mahratta rulers of Malwa and Berar, and the entire suppression of the Pindarries in 1817 and 1818, was this calamitous state of things brought to a close; it had continued, with increasing severity, for more than twenty years.

The rates of carriage which prevailed during this period of turbulence and insecurity are given by Sir John Malcolm, in his "Memoir of Central India."¹ Omitting those by cart, which are evidently invalidated by an error in the weight of the load, those which apply to the much more customary conveyance by bullocks are as follows:—

	Carriage per Ton per Mile.		Duties per Ton per Mile.	
	s.	d.	d.	
From Indore to Baroche	1	0-90	5-97	
„ Indore to Chota Odeypoor	1	6-05	6-02	
	Carriage and Duties together.			
	s.	d.		
From Indore to Oomrawuttee	1	7-90		
„ „ to Hoshungabad	4	1-90		
„ „ to Hyderabad	1	7-38		
„ „ to Jhansi :—				
Groceries	0	7-44		
Cloth	0	11-16		
„ „ to Kotah :—				
Groceries	1	1-67		
Cloth	1	2-79		

The great inequalities of these rates doubtless arose from the greater or less danger and difficulty of the routes; for instance, the route from Indore to Hoshungabad, to which the extreme rate of 4s. 2d. per ton per mile applies, lay directly through the

¹ Vol. ii., page 370.

chief haunts of the Pindarries. Judging from all the facts, it can hardly be doubted that although cotton was a coarse and common article, the cost of conveying and insuring it amounted in those days to 1*s.* per ton per mile, an assumption which derives support from a comparison of such prices of cotton at points distant from each other as the published records of the times afford¹. But the cost of carriage from Oomrawuttee to Mirzapore in 1846 was not more than 4*d.* per ton per mile², and for the greater part of the distance transit duties no longer exist. The difference, or 8*d.* per ton per mile, computed on 450 miles, comes to 1·61*d.* per lb.

From Mirzapore to Calcutta the transit was then, as now, by the Ganges. In the absence of information applying directly to the date of 1813, we may obtain some insight into the cost of conveyance and other intermediate charges. In 1796, the value of cotton at Jalown (near the Jumna River) was 1·87*d.* per lb.; the same cotton realizing in Bengal 5·38*d.* per lb.³; the difference, which was partly profits, partly duties now abolished, and partly cost of carriage, amounted to 3·50*d.* per lb., or on 650 miles 12·07*d.* per ton per mile. This, however, was a troubled period in that part of India, and our conclusions may be more safely drawn from the facts of the succeeding years, although they are less distinctly given. In 1802, the

¹ For instance, Nagpoor, or Hingenghaut, cotton was sold at Mirzapore, in 1789, at 4·59*d.* per lb.; (Reports and Documents, 1836, page 368,) and this is the latest price I have met with of Berar cotton at Mirzapore in those times: the earliest local price at Chandah, near Hingenghaut, is that of Mr. Fenwick, in 1817, which gives 1·17*d.* per lb. The risk of error, in comparing prices at dates so distant, is diminished by the probability, arising from the state of the country, that no great change of price had taken place in the interval, and from the fact that since that time the price has not greatly risen, being about 1·5*d.* per lb. in 1843. (Return of 1847, page 216.) The difference between 4·59*d.* at Mirzapore and 1·19*d.* at Chandah, or 3·24*d.* per lb., gives 1*s.* 5*d.* per ton per mile for carriage, insurance, and profit, on the 450 miles of the journey.

² Report, Maps, and Papers of the Great Indian Peninsula Railway Company, page 54, on the authority of a letter of Colonel Sleeman to J. C. See, also, Mr. Mercer's Report, in the Return of 1847, page 216.

³ Reports and Documents, 1836, page 16.

price at Jalown and other places on the Jumna, was from 1·99*d.* to 2·30*d.* per lb.¹; and, as late as 1832, it seems to have been at Calpee, in the same district, 1·95*d.* per lb.² During this period the price at Calcutta was ordinarily about 3½*d.* or 4*d.* per lb.³ This prevailing state of things was only interrupted in 1817, 1818, and 1819, by excessive speculations for England, during which the price of cotton was doubled at Calcutta, and at the places of growth in the valley of the Ganges; from which advance, however, it afterwards fell to its old standard. Taking the difference of price in 1813, as that between 2*d.* at Jalown and 3½*d.* at Calcutta, the charges and profits amounted, on the 650 intervening miles, to 6*d.* per ton per mile, of which scarcely less than 4*d.* per ton per mile can be set down as the cost of carriage on the Ganges in 1813. The present cost of conveying cotton down the river, from Mirzapore to Calcutta, is 1½ rupee for four maunds, which, reckoning the river distance at 500 miles, is equal to 0·47*d.* per ton per mile: the difference, or 3·53*d.* per ton per mile, on 500 miles, comes to 0·79*d.* per lb., as the probable decrease in the cost of carriage of cotton on the Ganges, from Mirzapore to Calcutta, since 1813⁴.

The total probable saving, since 1813, in cost of carriage of cotton from Berar, if the route had continued to be by Calcutta, may therefore be stated as follows:—

	Pence per lb.
From Berar to Mirzapore, diminutions of cost of land carriage, duties, &c., 8 <i>d.</i> per ton per mile; equal to	1·61
From Mirzapore to Calcutta, diminution of cost of water carriage, 3·53 <i>d.</i> per ton per mile; equal to	0·79
Total diminution of cost of carriage from Berar to Calcutta	2·40

4. *Change of Route.*—The European demand for the cotton fabrics of Bengal seems to have been greatly augmented in the

¹ Rep. and Doc., 1836, pp. 24 and 25. ² Rep. and Doc., 1836, page 235.

³ Wilson's *External Commerce of Bengal*, page 66.

⁴ Statement of M. Rustomjee, in "*Railways in India*," by an Engineer, 1847. Williams and Co., page 58.

latter half of the last century, or at least to have then greatly increased the traffic in the raw material between Berar and the marts on the Ganges; and this trade continued undiminished until the rapid extension and improvement of the English cotton manufacture, after the restoration of peace in Europe, first restricted the demand for Indian calicoes, in Europe and America, and then superseded those fabrics in their own country. The export of calicoes from Bengal, in 1816-7, was of the value of 1,659,994*l.* sterling; in 1826-7, a space of ten years only, it had fallen to one-sixth of that value, reaching but to 285,121*l.*¹ The latter date will be referred to shortly as that of the rise of the commerce in cotton between Berar and Bombay.

The outlet afforded by the manufactures of Bengal for the cotton of Berar was the most favourable one which existed in 1813, and for several following years. The trade with the Circars had the great disadvantage of a route which led for near 200 miles through unhealthy jungle and a disturbed country: to some extent this disadvantage was shared by the route to Surat. The countries to the south, Madras and Mysore, were supplied from the south of India, and from the country about the Kistna and Toongbuddra. The outlet by Bombay, now used to so great an extent, led through countries then the seat of hostilities between the Government of Poonah and the British, as well as of disputes amongst the Mahrattas themselves, which eventuated in the fall of the Peishwa; the customary disorders of the country had become aggravated by the looseness of the corrupt, needy, and tottering government; the transit duties afforded every petty local officer ample pretext and opportunity of extortion; the Ghauts were yet uncrossed by more made roads than the single one at the Malsej, made, or more probably restored, by Nana Furneeves, and even that was reached by difficult routes from the north and east, and led to a bad route through the Concan; the Concan itself, of a climate inimical to the men and cattle of the interior, and an

¹ Wilson's External Commerce of Bengal, page 7--Tables.

outlying and inferior province of the Mogul, and afterwards of the Mahratta Empires, was covered with wild forests, almost destitute of water in its northern part, through which the more direct line between Berar and Bombay would have led; and finally, if cotton could have reached Bombay through all these difficulties, it would then have met in competition that of Guzerat, cheaply carried to Bombay by sea. Nor is it at all unlikely that these difficulties so operated as to prevent mercantile men at Bombay, in those days, from even knowing what kind or quality of cotton Berar could supply, and at what prices it could be bought.

In time this state of things was improved. In 1818, the deposition of the Peishwa placed most of the territories to be traversed in the hands of the British Government, which until that period had no permanent footing even in the Concan; the termination of the internal dissensions of the Mahrattas was a consequence of the same event; and the establishment of the British administrative rule, which, though not always well-advised, or even just, was firm, methodical, and clean-handed, and conferred on the country a degree of internal security which it had rarely before enjoyed. In a few years the effects of the change became visible; and in 1824-5 an attempt was first made, by wealthy native merchants, to establish a traffic in cotton between Berar and Bombay. In this enterprise it appears Sir Jamsetjee Jeejeebhoy took the lead, and was quickly followed by Kurna Sunkur, Gopaljee, Rummal Sunkur¹, and Viccajee and Pestonjee Meerjee²; the last-mentioned firm, and possibly some of the others, had long been engaged in large transactions with the interior, not only of a mercantile character, but in the renting of government dues over extensive districts. After a few experimental trips the trade became permanently established, a result promoted, no doubt, in a very material degree, by the great falling off in the demand for Berar cotton, occasioned by the decline in the manufactures of Bengal, under

¹ Letter of T. Williamson Rumsey, Esq., to Lord Wharncliffe, 1846, page 32.

² From information obtained at Bombay.

the competition of England, to which I have before adverted. From this date, about 1826 or 1828, the trade in cotton between Berar and Mirzapore has decreased, and is probably now sustained chiefly by the consumption of that article by the vast population of the valley of the Ganges. The exportation of cotton from Calcutta to England shows also a marked decline from the same date.

Since this period, the opening of the road by the Bhore Ghaut in 1831, with some improvement in less important roads, the partial introduction of carts, and the abolition of the transit duties in the British territories in 1837, have given additional facilities to the trade. The present amount of cotton brought to Bombay through the Concan is, on an average, 18,000 tons, or 40,000,000 lbs. per annum, of which probably two-thirds are from Berar.

The saving effected by the change of route may be thus exhibited:—

	Pence per lb.
Present cost of conveyance from Berar by land to Mirzapore, 450 miles, at 4 <i>d.</i> per ton per mile; equal to	0·80
Present cost of conveyance from Mirzapore to Calcutta by water, 500 miles, at 0·47 <i>d.</i> per ton per mile; equal to	0·10
	<hr/> 0·90
Present cost of conveyance from Berar to Bombay ¹ , 1593 <i>d.</i> per ton; equal to	0·71
	<hr/> 0·19
Besides this, it is stated to me, on high mercantile authority, that ships are sailed 1 <i>l.</i> per ton more cheaply from Bombay than from Calcutta, which on 1375 lbs., the measured ton of cotton, is equal to	0·17
Total saving by change of route	<hr/> 0·36

No doubt some figures have been employed, under the two last heads, for which only probabilities and inferences can be quoted; the evidence, however, I apprehend will be deemed to show that they cannot be far from the truth, and that the state

¹ Report, Maps, and Papers of the G. I. P. R. Co., page 59.

of things which they describe is, on the whole, that which has existed: they supply, I think, the best light on the subject which can be obtained, unless the records of the India House, and of private commercial firms in England and India, were searched for specific facts.

Taking, then, these figures as sufficiently proved for present practical purposes, the results, briefly recapitulated, are as follows:—

	Pence per lb.
Fall in freights	2·00
Fall in exchange	2·21
Fall in cost of carriage	2·40
Diminution of cost by change of route	0·36
<hr/>	
Total diminution of charges between the Indian grower and the English spinner, from 1813 to the present time, say 7 <i>d.</i> per lb.	6·97 ¹

Since the price of Indian cotton in Liverpool has fallen since 1813 not less than 10*d.* per lb., the estimated saving in charges just exhibited is no more than was requisite to enable the export from Berar to maintain its existence; and a confirmatory consideration will be found in the fact, that the greater part of the fall in the charges took place in the early part of the period following 1813, and contemporaneously with the greater part of the fall in the price of Indian cotton at Liverpool.

This series of facts appears to me to afford two incontrovertible inferences:—

1. That the origin and extension of the export of cotton from India to England, and the magnitude it has now attained, of 60,000,000 lbs. per annum, are not to be attributed to any extra-official efforts of the Government, however costly, persevering or judicious, but entirely to the spirit of mercantile enterprise, and to the influence of ordinary mercantile considerations, operating in an improved state of India, which was brought

¹ In my evidence before the Committee of the House of Commons on the cotton trade of India, in 1848, I estimated this at only 5·45 pence per lb.; further examination leads me to believe that the statement now given is nearer the truth. The principal alteration is in the effect to be attributed to the fall in the exchange.

about by the Government, acting in its own proper character of conservator of the public peace and of private security.

2. That the difficulties removed, which would otherwise have wholly and long ago put an end to this export, are entirely of the class of costs intervening between the Indian grower and the English spinner, and have not permanently affected, in any appreciable degree, either the cotton itself, in its quality or condition, or the price obtained for it by the grower.

I shall next proceed to show that the further extension of the export from Berar is now prevented by a remaining difficulty of the same class as those which have been removed. The conclusion may safely be extended to all central peninsular India, since the cost of carriage is sufficiently alike in the different parts to produce the same general effects in each of them.

In considering this part of the subject, we shall have to deal with much smaller figures than heretofore. While Indian cotton, which had been bought from the grower at *1d.* or *1½d.* per lb., realized in England *10d.*, *15d.*, or *18d.* per lb.,—and while the cultivation and preparation of cotton in America was an art still under continual improvement from experience, and a pursuit which afforded ample room to all comers, the changes downwards would necessarily be large and striking. But the price of cotton has latterly reached a general standard, which is so low, that its occasional depressions, when they occur, render the crop less profitable in America than that of many other articles; and variations very small in comparison with those which formerly took place, will now afford, or destroy, a sufficient mercantile inducement to the commerce. One-tenth of *1d.* per lb. has perhaps as great an effect on the course of the cotton trade, under present circumstances, as the entire *1d.* had at the beginning of the period just reviewed.

The import of cotton into Bombay from Berar and Central Peninsular India in general, through the Concan, has been stationary for some years. In 1836, twelve years from the origin of the trade in cotton between Berar and Bombay, this import through the Concan had reached to 31,000,000 lbs.;

in 1845, nine years later, it was only 23,000,000 lbs.; the average of that nine years was 34,750,000 lbs.¹ All the causes of increase I have pointed out (except the abolition of the transit duties in 1837) had been in operation some years previous to 1836; and it seems clear that, notwithstanding their effect, the export ceased to increase, through the influence of some other difficulty, which they did not remove. The great remaining incidental cost is that of carriage, which I purpose to show is the particular difficulty that prevents further increase.

Before we go to the question of cost, it may be right to advert to the probability that, even independent of cost, the present means of carriage are not susceptible of material augmentation; so that if any amount of cotton were grown, stacked, and actually bought for export in Berar, we should still derive no benefit from it, from the impossibility of conveying it to the coast.

Mr. Fenwick² gives an instance occurring in 1843, in which he failed to deliver 5000 bullock loads of cotton at Bombay, through failure of carriage. In 1846, the drought prevented the employment of bullocks enough, and consequently ships lay in the harbour of Bombay, waiting in vain for the cotton which had been bought in the interior. More or less of such disappointment occurs in every season, and from different and even opposite causes. Rain too early, too scanty, or too plentiful;—drought;—epidemics amongst the cattle; and many other varieties of misfortune, contribute to render the transit uncertain, insufficient and costly. It is needless to dilate on a subject which has latterly had so much attention as this, and on which every traveller in India can tell his own confirmatory story. But as a matter of calculation it is worthy of note, that as 18,000 tons of cotton, the quantity now brought down, require 180,000 bullocks to carry them; and as this quantity is but one-tenth of the annual traffic both ways, between the coast near Bombay and the interior, it follows that 1,800,000 bullocks

¹ Report of the Bombay Committee, page 31.

² Report, Maps, and Papers of the G. I. P. R. Co., page 59.

per annum must pass by the few routes which the practicable passes of the Ghauts permit to be used, in order to carry that part of the traffic which comes under cognizance of the customs, to say nothing of any other.* It may well be apprehended, therefore, for reasons altogether independent of cost, that the country, receiving no rain for eight months in the year, would not easily bear an addition to the immense droves of pack cattle now employed, and that any attempt to increase them would only render permanent and usual, that which now occasionally occurs, viz., an exhaustion of the water and forage on the road. Works of great extent, accompanied by equal increase in the growth of forage, could alone obviate this difficulty, if pack cattle continue to be employed. Carts would mitigate but not remove the evil.

If, indeed, a rise of price in England were to take place, sufficient to justify the inland transit of cotton to Calcutta, and other points on the coast, at a greater expense than to Bombay, some relief in point of quantity might be obtained; but that rise, to induce the adoption of such an additional route, must be considerable and long continued; and after all we should obtain only a mere fraction of the produce of the Deccan, while we need to have possible command of the whole.

Cost alone, however, is sufficient to account for the present restriction of the export. The following table exhibits the facts on which my argument is founded. Its purpose is to show that from 1841 to 1846, the only years for which requisite facts are available, carriage by bullocks has often left the importer at Liverpool with little profit, and not unfrequently with a loss, while carriage by railway, all other things remaining the same, would have left in almost every case a profit sufficient to induce continuance and extension of the trade. In order to show this the table gives—

1. *The factor's price at Khamgaum*, in Berar, from information given me by Mr. Fenwick, and printed in the Report of the Parliamentary Committee of 1848, page 357.

2. The constant addition of 0·8*d.* per lb., of which 0·1*d.* is for

transit duties in the native states in the interior¹, and 0·2*d.* per lb. for the expenses of *screwing the cotton into bales, and shipping* it at Bombay.

3. The *freight from Bombay to Liverpool*, from the price currents of the Chamber of Commerce of Bombay, taking the highest and lowest during the months from February to June, in which the cotton of the interior arrives at Bombay, and calculated at the established rate of 1375 lbs. of cotton in each measured ton.

4. Two columns of cost of *inland conveyance from Khamgaum*, of which the first is that by *bullocks*, as given on the authority of Mr. Fenwick, in the Report of the *Great Indian Peninsula Railway Company*, page 58, with the constant addition of 0·262*d.* per lb. for attendants, boat and bunder charges, &c., &c., on the authority of Mr. Cowie, of Bombay; the second is the charge by *railway*, calculated at 2½*d.* per ton per mile on 303 miles, the distance from Khamgaum to Bombay, and amounting to 0·372*d.* per lb. Remarks.—The difference between these two columns would show the saving, in cost only, by railway. If the railway charge were reduced, as in time it might be, to 2*d.* per ton per mile, the cost would be 0·27*d.* per lb., effecting an additional saving of 0·1*d.* per lb.

5. Two columns of *prime cost at Liverpool*, the first with the cotton conveyed by *bullocks*, the second when conveyed by *rail*. The manner of forming these is very obvious, being by adding the previous columns together, taking the column for bullock carriage in one case, and that for rail carriage in the other.

6. The *prices of Surat cotton in Liverpool*. And 7. The same of American Uplands, on the high authority of Mr. Burn.

8 and 9. The *average import and export prices at Bombay* from pages 31 and 25 of the Report of the Bombay Committee.

¹ Varying, at times, from one-fifteenth of 1*d.* to one-fifth of 1*d.* per lb., but averaging about one-tenth of 1*d.* Parl. Rep. of 1848, page 380. In 1839 the increased demand for, and the advanced price of, cotton seem to have raised them to 0·823*d.* per lb.

Year.	Factor's Price at Khangam.	Transit Duties and Shipping Charges.	Freight from Bombay to Liverpool.	Costs of Inland Carriage.		Prime Cost at Liver- pool, without Profits at Bombay.		Prices in Liverpool.		Average Prices in Bombay.		Export of Cottons from Bombay to Great Britain, in lbs.
				By Bullock or Cart.	By Railway.	When carried by Bullock or Cart.	When carried by Railway.	Surat Cotton.	American Uplands.	Import Price.	Export Price.	
1836 { lowest highest	1 2-304 2-880	2 0-3 ...	3	4 A 0-673 ...	4 B 0-372 0-372	5 A	5 B	6 5-5 8-5	7 9 12	8 2-984 ...	9 3-520 ...	68,163,901
1837 { lowest highest	... ...	... ...	... ...	... ...	... ...	... ...	... ...	4-25 6	7 8-75	3-198 ...	3-296 ...	38,100,472
1838 { lowest highest	... ...	... ...	... ...	... ...	... ...	... ...	... ...	5-5 6-5	6-75 9	3-475 ...	3-245 ...	31,800,837
1839 { lowest highest	1-317 1-810	0-3 ...	0-698 0-959	0-673 0-673	0-372 0-372	2-988 3-742	2-687 3-441	4-75 6-25	5-75 7-75	3-110 ...	3-585 ...	59,001,134
1840 { lowest highest	... ...	... ...	0-567 1-090	... ...	... ...	... ...	... ...	4 5	5-25 7	3-252 ...	3-495 ...	81,581,688
1841 { lowest highest	1-724 2-117	0-3 0-3	0-611 0-915	0-810 0-889	0-372 0-372	3-445 4-221	3-007 3-704	3 5	4-625 6-75	2-897 ...	3-096 ...	104,795,091
1842 { lowest highest	1-567 2-140	0-3 0-3	0-262 0-654	0-477 0-771	0-372 0-372	2-596 3-865	2-501 3-466	3-75 4-5	4 6	2-695 ...	2-948 ...	69,339,914
1843 { lowest highest	1-391 1-440	0-3 0-3	0-262 0-480	0-693 1-242	0-372 0-372	2-646 3-462	2-325 2-592	3-125 4-125	4-875 6	2-867 ...	2-825 ...	91,781,838
1844 { lowest highest	1-567 1-861	0-3 0-3	0-398 0-698	0-614 0-659	0-372 0-372	2-874 3-518	2-632 3-231	4 4-25	3-375 4-625	2-710 ...	2-621 ...	62,296,954
1845 { lowest highest	1-445 1-587	0-3 0-3	0-480 0-741	0-614 0-678	0-372 0-372	2-839 3-306	2-597 3-000	2-5 3-375	3-375 4-5	2-853 ...	2-440 ...	47,105,311
1846 { lowest highest	1-254 1-450	0-3 0-3	0-349 0-698	0-643 0-732	0-372 0-372	2-546 3-214	2-275 2-854	4-5 6	6 7-5	2-331 ...	2-327 ...	

All in pence per lb.

Remark.—A confirmation of the general accuracy of the statements given in this table will be found in the agreement within practical limits, of the sum of columns No. 1, 2, and 4 A with No. 8, the import price of Bombay, derived from an altogether different source.

It is hardly necessary to remark that the least and greatest prices and costs for each year are given in separate lines, and that the lowest and highest costs at Liverpool are made by adding all lowest and highest costs together respectively.

Several important inferences would be deduced by a careful examination of the table, of which I shall notice only those more immediately connected with my principal object.

The columns 5 A and 5 B give the lowest and highest prime costs in Liverpool, without profits in Bombay; the first when the cotton was carried by bullocks, at the rates actually existing in each year; the second on the supposition that it had been carried by railway at $2\frac{3}{4}d.$ per ton per mile, including charges of delivery, &c. Now on comparing the first of these columns with that of the prices of Surat cotton at Liverpool, it will be

NOTE ON TABLE, PAGE 82.

It is to be regretted that facts are not forthcoming which would have shown the state of the trade during the increase of the export from Berar through the Concan to Bombay up to 1836, and thence to 1840. A few particulars, however, which are gathered from several quarters, will throw some light on this period. In 1836, the factor's price at Khamgaum was as much as $2.304d.$ to $2.386d.$ per lb., nearly double the usual price; but this, after expenses paid, could have borne very little profit at Bombay, where it was but $2.984d.$ per lb.: it was exported, however, at a price of $3.520d.$, and sold in Liverpool from $5\frac{1}{2}d.$ to $8d.$ In 1839, the price at Khamgaum had fallen to $1.317d.$ per lb., at which time $1.177d.$ per lb. was said to be a price satisfactory to the cultivators of Candeish. The Bombay import and export prices at this time were $3.110d.$ and $3.585d.$, and the Liverpool prices $4\frac{3}{4}d.$ to $6\frac{1}{2}d.$; exportation to England accordingly increased to 1841, when the losses exhibited in the table occurred, and the export declined to 47,000,000 lbs. in 1845, and in 1846 the Bombay committee was appointed. Since the last period in the table, the scantiness of the American supply, the increase of the Lancashire consumption and the consequent rise of price, have raised again the Indian export—have, in fact, added another instance to the vicissitudes of the Indian market, occasioned by the immense preponderance of the variable American supply.

found that in 1841, 1842, 1843, and 1845, four years out of six, the highest prime cost in Liverpool, *by bullock*, exceeds the lowest sale price of Surats in that place, even though no profits were taken in Bombay. It must, therefore, have happened that the habitual state of the export of cotton from Bombay to Liverpool was one of risk, uncertainty, and discouragement; often, no doubt, great losses occurred. But if the same comparison be made with respect to the next column, viz., that which gives the prime cost at Liverpool, on the supposition that the cotton had been carried by *railway*, only two cases of the kind occur, viz., in 1841 and 1845, and even in those two the loss would have been diminished in one $\frac{1}{2}d.$, and in the other $\frac{3}{4}d.$ per lb. The influence of these two very different conditions of the trade can, perhaps, hardly be overrated. The export to England, which, under the stimulus of considerable profits, had risen in 1840 to 81,000,000 lbs., and in 1841 to 104,000,000 lbs., declined in 1845 to 47,000,000 lbs. The overwhelming influence of American prices at Liverpool placed it beyond the power of the trade of India, carried on by bullocks, to sustain the competition; but, even with that influence against her, Berar, *with a railway*, could always have held her place in the market, and would rarely have gone without a profit.

The same character of uncertainty and of insufficiency of mercantile inducement has marked the transactions in cotton at Bombay. Comparing columns 8 and 9, it will be observed that in the later years of the series the export has not always exceeded the import price; and that, on the whole, the mercantile community of Bombay have not had the motives for extending the export, which are to be found in other departments of commerce.

It simplifies very much the character of the argument to observe, that the mere money difference between bullock and rail carriage would have remedied this state of things, and would have converted a hazardous into a certain trade; nor does it appear likely that the existence and effects of the railway itself

would so have changed the circumstances as to invalidate the inference; for, since abundance of unoccupied land and labour are available in the interior for the extension of the supply, an increase of the demand could not have greatly or permanently affected the cultivator's price, while the profits of the intermediate agents would always have been under a degree of control, by means of facilitated communications, to which they cannot now be subjected.

But while I prefer to restrict my argument to the effects of the mere money saving by the railway, and consider it a very fortunate circumstance for the progress of India that the case may rest safely even on that low ground, it would be doing great injustice to the subject not to advert to two additional and very obvious considerations:—first, that the foregoing computations suppose a railway rate of $2\frac{3}{4}d.$ per ton per mile, a rate which, in time, would certainly be reduced, and the reduction of which would add very much to the certainty of all these operations; secondly, that the vast collateral advantages, scientific, commercial, and governmental, which would of necessity follow upon the action of the railway, would probably much outweigh its more direct and computable effect. The combined committee of government officers and merchants appointed, in 1846, by the Government of Bombay, to investigate the state of the cotton trade, state it as their opinion, page 22, that the costs, losses, deterioration, delay, and disadvantages of all kinds, incident to the present mode of inland conveyance, “can hardly be less on the average of the year” than $1d.$ per lb. If so, the argument I have employed is most firmly established; for even the difference only between that cost and loss and the charge by railway, a difference amounting to $\frac{2}{3}$ ths (or 0.625) of $1d.$ per lb., comes to 20 or 30 per cent. of the cost of the cotton in Berar, or sometimes to 15 per cent. of its value in Liverpool, and is ample of itself for profit.

Without, then, taking into account the important considerations of rapidity of commercial operations, certainty and speed of intelligence, immunity from pilfering and deterioration, and

other advantages inseparable from railway transit, which, however important, are not easily expressed in figures, I conceive we have, in the foregoing facts, a basis on which to rest our future arguments and expectations, as to the measures to be taken for ensuring an increase of the supply of cotton from the interior of India: and I purpose to take as proved the following proposition, viz., that, with a railway, the indigenous cotton of central peninsular India, of its present condition and quality, would have a safe and constant market at Liverpool, which it has not had, and could not have had, while employing the present means of conveyance.

My next object will be to examine the consequences of a certain, open, and constant market in England for the native cotton of this part of India.

**EFFECTS IN INDIA OF A CONSTANT MARKET FOR INDIAN
COTTON IN ENGLAND, AND OF IMPROVED MEANS OF TRAN-
SIT IN INDIA.**

IN the present circumstances of India, the effect of an open and certain trade on the quantity of cotton produced and exported, is too obvious to need much remark; but as it is the first indispensable step in the whole series of improvements, it is necessary to examine its mode of operation. Immense tracks of country now waste their vast fertility in the production only of *jungles and forests, the demesne of wild beasts, and the sources of malaria, still more deadly than they*; while men, in all quarters, put forth but half their powers. The first consequence of a material reduction in the cost of carriage must be a greater demand for cotton in the interior, with or without an advance of price. In either case, but more rapidly if accompanied by an advance of price, more land comes into cultivation, while more people become engaged in furnishing the supply and dependent on being employed in it: wealth comes into the country as an absolute addition to former wealth, being the creation of labour formerly idle, and of lands formerly worse than waste: new wants and new tastes are awakened; and thus a new degree of dependence on the new industry is established in the usages and feelings of the people. The further the supply of the present kind of cotton, or of any kind of cotton, is carried, the more intimate becomes the connection between the Indian grower and the English spinner; and the more the English is made to overweigh the native home demand, the more strongly will the native agriculturist feel that his personal success

depends on securing and improving his British connection, and the more vividly will he feel the necessity of conforming to the requisitions of the English market, the more correct will his knowledge of what that market demands become, and the greater will be his means of adopting whatever improvements the case may at any time seem to require.

This is no mere sketch of an imaginary progress; it is the real history of the growth and management of cotton in America. (See Seabrook on the Growth of Cotton; or, Reports of Board of Trade, Commercial Tariffs, part xv., pages 615 to 620.) Even so late as 1820, the cleaning and preparation of cotton for market in the United States, seems to have been little less careless and incomplete than that now practised in India. But the American planter has always depended on, and has been able to trust to, the English and other manufacturing markets; he has therefore constantly exerted himself to retain and improve the advantages to be derived from the connection; and I conceive that whenever we induce any considerable number of the natives of India to place themselves in the same state of dependence, by affording to them the same certain advantages from it, we shall find them making the same efforts and effecting the same improvements as we have witnessed in America¹. We shall then have, not merely the partial and exotic attempts of a few government officers, merchants, or philanthropists, but the care and labour of the people themselves, exerted in their own proper business, and under the inducement of their own proper and well-founded hopes. Facts seem to warrant the conclusion, that a change in the means of carriage from

¹ Guzerat, with cheap sea carriage, may seem to be a case to the contrary. The truth, however, appears to be that the China market acts on the limited production of Guzerat just as the Indian home market does on the growth of the interior; it affords a demand for cotton grown in the usual and least inconvenient way. Our real difficulty in India as to quality is, that our present demand goes no further than ~~that~~ any cotton, which might otherwise have come to us, can easily be merged in the home consumption, or disposed of in some less critical market. When our demand goes permanently beyond that limit, in any district, the quality will improve; and, I believe, not until then.

bullocks, or even carts, to railway, will assuredly afford, and is the only means of affording, such certainty and profit to the commerce in cotton between Bombay and the interior of India, as will necessarily put into action this infallible process of spontaneous and wide-spread improvement. Happily, too, the present state of the internal traffic of western India is such as to render this first step safe, and even highly profitable, on its own account; so that even its entire failure in relation to cotton would entail no loss as to the capital employed in the attempt. It is not often that the first movement in so great a change can be taken, with such an absence of risk.

Special causes of depression, or measures of improvement, have been alleged or urged by different parties; and it may be proper to inquire into the effect of improved means of communication on each of them.

The establishment of European agencies in the cotton districts would become at once less necessary and more practicable than at present. This measure, which has been much urged by gentlemen whose official position and prospects leave them little opportunity of estimating the inducements and anxieties of a mercantile life, seems not very likely to be prosecuted to any great extent while the chances of a favourable issue in the English market, of the transactions to be entered into in the interior, remain so small and uncertain as they have been for the last several years. Any European really competent to such an undertaking would make better use of his time and means at the presidencies, without incurring the risks to property, health, and life, which a continued and isolated residence in the interior now involves. These risks would be materially diminished, indeed, for the most part removed, by the adoption of an improved mode of transit; and, from their nature, they can be diminished in no other way. Whenever this is done, agencies in the interior will naturally spring up, as private interests require them.

It does not, however, seem at all necessary to look exclusively, or even principally, to European agency, for the exten-

sion of the trade in cotton between Bombay and the interior. That trade as it now exists is chiefly the work of native enterprise¹; and the stop put to the increase of that trade of late years is clearly traceable to causes which native enterprise, as at present instructed, is not able to remove. Whenever those causes are removed (and only the establishment of improved means of transit can remove them) there is every reason to conclude that the same native commercial energy which has raised the cotton trade of Bombay to its present magnitude, and which carries on the great internal commerce of India, will neither be found backward to associate itself with European intelligence, as it has hitherto done, nor unequal, with that associated intelligence, to carry the trade in cotton, between the interior and the coast, to any extent which the English consumption may require. The ordinary and natural course of business establishes in America all needful agency; and so it does in India, wherever a fair hope of profit leads to the effort.

These remarks will not be understood as undervaluing the establishment in the interior of an improved system of agency, whether European or native. Nothing can be worse than the present state of things. The great money lender makes advances to the little money lender, and he in turn to the cultivator. The cultivator, bound by inextricable indebtedness to

¹ "The exporters of cotton to the coast are chiefly opulent individuals and native firms of Bombay. They have *gomashtas*" (agents or factors) "who have located themselves at Khamgaum, from whence they send out subordinates to the several *pergunnahs*, to make advances to *patells* and substantial *ryots* of villages, about two months previous to the gathering, at 2 per cent. per month. Such security is taken as can be got, and they deem good, usually of *mahajuns*, or able and wealthy *patells* themselves. They likewise purchase cotton from the *mahajuns* who are settled in the *kusbas*, and almost every respectable village in the country, these *mahajuns* having made advances to the *ryots* in the similar way.

"When the cotton begins to come in, the principal *talookdars* and *mahajuns* of large towns and *peints* meet and fix what is called a '*Sahookars*' price,' and receive the wool from the producers (cleared from the seed) at the *kusba* or *peint*, or, according to agreement, at the village itself. They take a discount of one rupee per *nug* (about 0.1d. per lb.), on account of the advances made by them."—*Mr. Fenwick to the Agri-Hort. Soc. of Bombay*, 16th Dec., 1836.

his immediate creditor, cares little for his crop beyond its satisfying the immediate claim on him. The little money lender takes the crops of, perhaps, 100 cultivators, and the great money lender the collected crops of, perhaps, 100 little ones: all are mixed together, and no one man feels for himself much of the consequences of faulty cultivation, of negligence, or of fraud. A system simpler and more direct, which would place on the ryot's own interests the consequences, for good or evil, of his own conduct, can only be the result of cheap, speedy, and frequent communication, both personally and by letter, between the seat of the export commerce and the producing districts of the interior.

It may be admitted that native agency, and indeed the general spirit of native business, are too often marked by an eager and uncalculating desire to grasp great present advantages, without regard to the effect on the interests of others, or to future general results; nor does the native moral code supply any serious check to this tendency. The evil is greatly aggravated by the continual and universal indebtedness of the people, who often plunge themselves for life into dependence, by the expenses of great family occurrences, as marriages, and the like. But if we are to hope for any remedy short of the general elevation, moral and intellectual, of the whole people, borrowers and lenders alike, we can only expect to find it in facilities which admit others to the same field of enterprise,—those who, with a truer calculation of their own interest, or a more considerate regard for that of others, shall act upon a sounder and safer system. If European foresight and feeling will here operate to any better effect than native usage and experience, better means of transit are indispensable to give the growers and the consumers of cotton the resulting advantages. While the commercial transactions of the interior are shut up to Europeans by mere difficulty of access, we must be content with any consequences we may think fit to ascribe to the character and tendency of native money lending.

In every view, therefore, of the relations of knowledge and

capital to labour, which can be effected by the extension of European intercourse with the interior, the improvement of the means of transit is the great indispensable step preliminary to all substantial advance; and this step taken, the way is open for the natural and proper operation of those interests which everywhere else, when left to their unfettered action, employ eventually the fittest and best agencies, and place them where they can most contribute to the general good.

Improved cultivation, better varieties of the cotton plant, and irrigation, class themselves together, being to some extent affected by the same considerations.

The published papers of the East India Company exhibit on their face the difficulties which beset attempts to establish these improvements in the general usage of the country; and they point, not very obscurely, to the cause of them. A rural population, not raised by extended intercourse above a very limited range of desires, cannot wish very earnestly for changes in a system which, as it stands, supplies all they feel to want. The men themselves must be operated upon by means of that which they already practise and approve, before they will perceive the desirableness of improvements, or suppose they possess the power of effecting them. Food, very scanty clothing, and often worse habitations, constitute at present the chief possessions of the majority of the Indian growers of cotton: a few hoarded rupees or jewels, and the means of making family shows, are the utmost of their hopes. These matters, small as they are, they fear to lose by change; nor are they likely to acquire courage until some expectation more to be relied on than the English market shall awaken their energies,—the English market, always a mystery to them, and sometimes worse.

Not, indeed, that the Hindoos are insensible to the motives which ordinarily operate on ourselves; but in present circumstances the facts to supply the motives do not reach them. Whenever positive and obvious advantages, within their comprehension and means of attainment, have been presented to them, the change which has followed has surprised all who

have witnessed it. But to ask them to adopt improvements which, however important and certain of success in our better informed judgment, seem to them to have no certainty of either success or profit, is to hope that they will follow a course which, in the same case, we ourselves should certainly avoid. If a Manchester spinner were desired to alter his machinery, and disturb all his connections, in order to supply some new article for a half mythical city in central Africa, from which the demand was now for all he could make, and then (the reason unknown) for none at all, there can be little doubt that he would act exactly as the growers of cotton in India have done. The difference would be merely that between disorganizing a mill of a thousand hands in one case, and misapplying all that a man has, although his farm be but of ten acres, on the other; in each case it is the risk of all that a man has.

Here then, obviously, is one great source of the difficulties which have hindered the introduction of improvements, and which have rendered of so little effect the efforts for this purpose, persevered in for seventy years by the East India Company. Latterly, indeed, some better prospect of success has shown itself in the South Mahratta Country, Candeish, and Coimbatore; for the laborious and long-continued exertions of men to whom much public gratitude is due, have at length afforded, in a small degree, and artificially, in a few districts, that better information and have raised that more hopeful spirit, which an effective system of transit would have spread all over the whole country, as one of its earliest, most natural, and most certain consequences.

Looking, however, at the proposed improvements themselves;—improved cultivation requires both increased capital and improved implements;—and since the natives of India have evinced a remarkable carefulness of observation as to natural facts, and often no little skill in their rude application of those facts to their own purposes, it would appear that capital and implements are really the great remaining necessities of Indian agriculture. The poverty of India is briefly discussed elsewhere; the absence

of mechanical skill in the rural districts is an impediment of the most serious character, which clogs every step in advance, and is found in every quarter of the land¹. The latter, I apprehend,

¹ The village system of India, although admirable for its primary and proper purpose—that of municipal government—is, I believe, chargeable with being the origin of so much of the evils of that country as has resulted from the extremely low state of the village artisanship. In other points of view, also, this system is well worthy of careful attention. In the purity of this system each village is a corporation, we may almost say a republic, having a less intimate relation to the general government than the members of the village have with each other. The officers charged with the municipal government are the patel, or head-man; the chougula, his assistant; and the koolkurnee, or accountant; with some subordinates. I use the terms employed in the Mahratta country; the officers are the same, under different names, in nearly all parts of India. So far the system, as to my present argument, is not to be impugned. But besides these officers, the village maintains, also, as *public officers*, and paid like the others in grain or in tax-free lands, a band of artisans. Of these, which, with the washerman, astrologer, bard, dancing girl, water carrier, &c., should number twenty-four, when the list is full, the carpenter is the head; next to him comes the blacksmith: the goldsmith and assayer of coins, the shoemaker, the potter, the barber, the leather rope maker, the butcher, also figure in the list. All these are supported by the village as public servants, the number being curtailed of the less-needed ones, or the appointments doubled or trebled, as the magnitude of the village may require. The remuneration, besides a portion of land free of impost, is by a stipend of grain, commuted sometimes for money, from each cultivator; in return for which customary services are performed. In the case of the carpenter and blacksmith these services extend, I was informed, to all work required by the repair and, I think, construction of implements, wells, and other matters connected with cultivation; but not to work required by the repair or construction of houses, or other purposes.

We shall easily understand this system if we consider it as a method devised, in the early ages of India, for providing for the wants of the inhabitants when the villages were remote from each other and difficult of access, and money was almost unknown: and down to the present day the isolation of the villages from each other, during several months of the year, by unbridged full watercourses, and the labour and difficulty of transit at all times, has strongly tended to perpetuate the system. On this plan a community might subsist, and enjoy a given low scale of conveniences and pleasures, almost without intercourse with other villages, and without the use of money. But just because it did supply a system of co-operation, by which that given low scale of enjoyment could be maintained without intercourse, did it also prevent that growth of desire and of effort which is indispensable to social advance; it stereotyped the India of that day, and contributed to cause that absence of roads, and of the remains of them, which shows how few of those essential means of improvement India has ever possessed.

would be in no other way so certainly and generally remedied as by the establishment of a means of transit which requires varied mechanical means of the highest order, and which should lead to the gradual supercession of that system by which the endowed artisans of a village are secured from competition and rendered almost independent of their skill for a living. A state of society, new and highly improved in many respects, must result from the use of means of intercourse which the natives of India never have enjoyed, and one of its first consequences cannot fail to be the establishment of that indispensable preliminary to improved cultivation, a higher style of village artisanship.

It is yet uncertain, as to some important parts of India,

Nor has its influence on individual arts and artisans been less important or remarkable; and the village carpenter and blacksmith (whose skill is so important in England, but which from its being invariably enjoyed we can here so little appreciate) are in India often the most inexpert and inefficient of men. Here and there is found an enterprising genius, who, breaking the ancient bounds, imitates well and laudably the work and plans of the English; but these are indeed few and far between. The plough, the drill-plough, the cart, and the well of a Mahratta testify too plainly to the state of the mechanical arts where an agricultural population most needs them. Surely we cannot wonder that artisans, who have little to hope for from improvements, and nothing to fear from competition, should be at no pains to improve themselves.

While the village system has been materially infringed by successive governments, and especially by our own, in the distribution of and right to lands and municipal offices, (subjects which do not come within the range of the present remarks,) it has remained, in most parts of the cotton districts, in its ancient force as to artisans; and I conceive that one of the effects of the railway system will be to bring into every village affected by it such a knowledge of the contrivances and appliances of other countries, and such means of obtaining them, as will first put the hereditary and stipendiary village artisanship of India to full proof of its capabilities, and then, if needful, supply its defects. This natural result was promptly illustrated by the patel of a village, to whom I put this question:—"Suppose I brought you a plough very superior to your own, but one the like of which your balowty blacksmith could not make; what would you do?" "Stop his balowty allowance till he could," was the reply. Without anticipating so violent dealing with the system as this, it cannot be doubted that, under the influence of railways, all the great disadvantages of that system must eventually disappear, and the plough, cart, and well of the Mahratta ryot become as efficient as those of an English farmer.

what difference of culture is required for the successful use of a different variety of the cotton plant; nor is it at all certain that the properties of the American plant are not as much dependent for their preservation on suitable cultivation as on their specific original character. Probably even the indigenous plant of India is capable, under suitable culture, of supplying a produce far more acceptable than the present, and perhaps as appropriate to some purposes as that of America to others. Desirable, therefore, as the introduction of improved varieties may be, it can scarcely be doubted that on improved cultivation, whether of one kind of cotton or the other, must improved produce ultimately depend.

If we look to any one measure of improved cultivation as more important in India, and yet of more difficult attainment than any other, we shall probably select irrigation. Nearly every experiment tends to show that, in some way or other, not yet much understood, the due supply of moisture, whether to the soil or the air, neither too much nor too little, nor at improper times, is an indispensable element in the means of a successful growth of cotton. The natural advantages of the countries of suitable temperature, both in India and elsewhere, which most cheaply produce cotton of acceptable qualities, seem to lie in a considerable degree in the fact, that their soil and climate fulfil, of themselves, this necessary condition in respect of moisture; and in some of the most successful garden experiments, in parts of India which do not produce acceptable cotton under field culture, irrigation seems to have had much to do with the result¹. But in Western and Central India there are almost no machines for raising water; certainly none moved by inanimate power. The wheel and pots, actuated by the feet and hands of a man, and the direct pull of bullocks, in raising a leathern bucket from a well, seem to be all the devices in

For the effect of irrigation as acting within a limited space through the atmosphere, see Lieut.-Col. Sykes on the Atmospheric Tides and Meteorology of Dukhun, (or the Deccan,) Phil. Trans., 1835, part i., page 191; where heavy local dews are described which seem to have depended entirely on the proximity of water.

general use. As to the employment of wind or water for any such purpose, it seems never to have entered the imagination of any of the natives; and a pump is altogether unknown in the interior, except to a few as a curiosity¹.

¹ The decay of ancient works of irrigation is, I apprehend, not difficult to explain. In no country, however prolific, will more food be proposed to be grown, in any year, than it is supposed can be consumed on the spot, or carried to other markets. The probable necessities of the population to be fed, and not the capabilities of the soil, will, on the whole, regulate the attempted crop. In the late disturbed state of India, the crops were often destroyed by armies, and were always in danger from marauders; while multitudes of men, who had to be fed, were withdrawn, for military purposes, from agricultural labour. Hence more food would then be grown, or at least sown, in proportion to population than in the peaceable times which have followed, because more would be rendered unproductive or be wasted; while labour being then less available for agriculture, that food would require to be grown with all advantages of soil and irrigation. As, however, plenty followed in the wake of security, and labour became more plentiful from the return of the soldiery to their fields, wages fell, and the advantages of soil and irrigation would become of less value and be gradually disused, unless distant markets opened for the produce. Hence, I apprehend, the fact that works of irrigation have decayed in the face of an increasing population. For instance, in Candeish very many bunds (river embankments formed for purposes of irrigation), which were kept in repair under former governments, have, under ours, fallen into decay; nevertheless, not only has the population of Candeish increased considerably under our rule, but, in 1846 or 1847, the collector was obliged to grant remissions of land-tax, "because the abundance of former years lay stagnating in the province, and the low prices of grain from that cause, combined with a partial failure of the crop last year, prevented the ryots from being able to pay their fixed land assessment." Under these circumstances the restoration of the bunds in Candeish would appear to me to be just so much waste of money, unless the means of transit for the consequent increase of the crop were provided. If a population is well supplied with all that can be produced on the spot, and has no means of sending away the surplus, it must be mere "strenuous idleness" to set up artificial means of increasing the supply, however valuable those means may become when facilities of export have first been secured.

The effect of local changes, in the local distribution of the people, is still more ancient. A city, formerly populous, would then require its food to be grown in its own vicinity; for in India neither would that food have been safe at a distance, nor would it have been practicable to carry it far: when that city, in the course of political changes, became deserted, its works would remain, evidences indeed of the existence of a former population, but of no present use. Vast numbers of tanks are now to be found in districts once the seats of Hindoo empire, but which have been covered with jungle for ages.

The case of Candeish, by an indirect consequence, is partly illustrative of this

But in the cotton-growing countries of Central and Peninsular India, irrigation, to be practised during the months when it is most needed, must be effected by cheaply and readily lifting water from wells, or from the beds of rivers, from 30 to 100 feet below the surface to be irrigated; a process of no great difficulty or expense, if suitable mechanical means were employed, especially where, as in many places, steady wind is mostly available. But there is no suitable skill in the country,—a deprivation the impoverishing consequences of which may be judged of when it is stated that irrigated lands, even in the districts near the Ghauts, pay three times as much tax, appear to afford ten or twelve times as much labour, and to yield twelve or fifteen times as much profit, as the same area without irrigation.

This general absence of a process so profitable as irrigation,

principle. Formerly it depended less on the growth of grain than on that of more valuable plants; but in those days there were neighbouring districts, particularly fitted for the growth of grain, which were wealthy enough to take in return its peculiar products; viz., the country north of the Sautpoora range, desolated by Holkar in 1803, and since become a permanent and deadly jungle, and the upper parts of the valley of the Nerbudda, long ravaged by the Pindarries and vexed with wars; besides others. For the crops then grown for them, and with which it purchased grain, Candeish has now no outlet; and its grain is consequently grown at home. Since, therefore, the period when the tanks of this country could be profitably employed, the customers for their special products have disappeared, and the province, with dilapidated tanks, provides itself with all it can consume. As a means of export it is now growing cotton, and is gradually adopting the American variety.

No doubt some late extensions of irrigation have greatly contributed to the welfare of the districts in which they have taken place; and it is impossible to witness efforts like those of Major Cotton, in the Madras provinces, without wishing them great success and extensive imitation. But I must venture to say that, in every case, it will be found, either that along with extended irrigation there have existed natural facilities for the export of the produce, or that districts so improved have become populous, not so much by natural increase, as by migration to the district, induced by the improved means of cultivation.

Is it not worth consideration whether a system of leasing the extra revenue to be derived from irrigation could not be devised, so as to bring private enterprise to provide the works? And would not the effect of such a system, if its details were judiciously devised, be to establish irrigation wherever it would be profitable, and to prove where it would not be so?

and of all the means whereby it would be effected, is to be accounted for, I conceive, only on the supposition that the interests of the people, as regulated by their present standard of enjoyment, and by their present means of prosecuting any purposes they may form, do not require them; and, until improvement takes place in these fundamental matters, I suppose a thousand windmills and pumps, if landed complete at Bombay, would either lie rotting on the beach, or be left to decay unrepaired wherever they might be erected, from want both of local skill and of local interest in them. The remedy, I conceive, will be found in raising a felt need of them, by affording an outlet and demand for produce fit for export, and in introducing into the interior pursuits which require and exhibit the skill which is also necessary to these indispensable agricultural improvements.

The probability that the introduction of such improvements would soon be followed by great increase in the weight of the crops, as well as by advance in the quality of the fibre, rests on the fact that, in almost every part of India, even in those which now send us no cotton, careful garden cultivation has often raised samples of remarkable excellence. Now the very business of agricultural implements is to bring cheap and wholesale operations in the field, nearer and nearer in excellence and effect, to the costly and limited manipulations of the garden¹:

¹ "Lieut. Doolan, at Sangor, planted wheat and grain in this way," (that is, at intervals of several feet,) "and, although he had the corresponding saving of seed, the out-turn was much in excess of the ordinary returns from the same space of ground; showing, as usual, how much freeness of ventilation is advantageous in agriculture. Lieut. Doolan has been following the same system this year, turning up the ground with a deep, iron, English plough; and it was quite refreshing to observe the healthy state of his crops, when compared with the neighbouring fields, sown at the same time; the latter were all drying up for want of moisture, but Doolan's plough had so well done its work, that his plants had thrown deep shoots into the broken soil, and were fresh and flourishing: the natives were quite surprised at the result. Of course, we cannot expect the natives to use iron ploughs; but your American wooden ploughs will, no doubt, show an almost equally advantageous result. Go on;—prosper."—Return of 1847, page 124.

Natives "cannot be expected to use iron ploughs?" Why not? For want of means of construction, means of purchase, and means of transport for augmented and improved produce.

and since the latter have shown, by their results, that the climate and soil of India are not incapable of such assistance or correction as shall permit the production of excellent cotton, even where none is now produced, to any advantage, we may confidently infer that the improvement of the mechanical operations of field culture, aided, of course, by chemical science, will be followed by great advances in the quality and quantity of the crops: and in this India would but follow the precedent of America, where improvement of cultivation has been at least as remarkable as that of cleaning and management¹.

The force of these observations would, perhaps, be more generally felt, but for a widely-extended impression that India is a country altogether of a peculiar constitution, mysteriously exempt from the influence of causes which ordinarily operate amongst ourselves. We are very apt to be content with the idea that the Hindoo contrives to effect those objects by means of the rudest implements, the most diminutive cattle, and skill of hereditary derivation, which we know to be everywhere beside dependent on the most careful deductions of science, and the most efficient devices of art. Our agricultural meetings teem with improvements on implements already elaborated almost to fastidious perfection, while we deem the Hindoo plough incapable of amendment *for Hindoo purposes*, or at least we fail to reckon its defects amongst the causes of inferiority or failure. Our best help to India, I believe, will be found in measures which raise the hopefulness, intelligence, and efficiency of its rural industry: and whoever desires to see that great country flourish, will watch with corresponding interest the progress of its roads, its village artizanship, its ploughs, and its pumps; and to the general diffusion of the motives and capabilities which must originate and sustain this progress, nothing, I believe, can possibly contribute so much as railways.

The several topics of the poverty of the people, famines, and the land-tax may be grouped together, from their actual or sup-

posed connection with each other. That the bulk of the population of India is extremely poor is, I believe, a fact no longer concealed from us by the present or traditional splendour of its princes, or by the ruinous magnitude of the armies it formerly maintained. The consequences of this poverty, and the means of remedying it, require discussions which do not permit space for inquiry into its remote history; but I may go so far as to express an opinion that it is by no means recently that India has fallen under this heavy disadvantage. The fact, as a present fact, is admitted; the enormous evils which flow from the bondage of the cultivators to the money-lenders are often descanted on and lamented; this bondage cannot have originated suddenly, or in any very modern cause, and nobody looks for its speedy or sudden termination. It has, therefore, to be discussed as a chronic if not a very ancient evil; and the question is,—“How comes it to exist from generation to generation, apparently without remedy or mitigation?”

Perhaps the only attempt to account for this poverty, which has been much heard of in England, is that which ascribes it to over taxation on our part. Besides, however, that it does not appear that India pays a greater amount of taxes now than formerly¹, (probably indeed, under all heads, less,) nor that

¹ A just and full comparison of the economic condition of the natives of the different parts of India, at various periods, under former governments and our own, would be a very interesting and instructive task: it is to be apprehended, however, that the materials for such an undertaking do not exist. The following slight gleanings of facts may tend to raise a probability that a more extended investigation would not establish any claim for preference on the part of “the good old times,” even in India, so far as the economic condition of the people was affected by the amount and mode of taxation, and the character of the governing for which that taxation paid.

The reign of the emperor Akbar, which commenced A.D. 1556, and closed, by his death, in 1605, is always referred to as the brightest period of modern Indian history: nor is it without reason that the tolerant principles and multifarious reforms of that monarch have left so rare a fame behind them. Happily Abul Fazl, the indefatigable minister and confidential friend of Akbar, has left, in the *Ayeen Akbary*, an account of the habits and household of the emperor, the institutions of the government, and the amount and mode of taxation. This account, if not free from faults which adulation of his master might inspire, (really reflected praise, to some extent, of himself,) is at once minute and comprehensive on many subjects in respect

the poverty so justly deplored had its origin in our times, this explanation, if well founded, only throws us back on a further

to which no motive for misrepresentation could be supposed to operate. A few particulars, gleaned chiefly from this account, may assist in showing whether the present condition, at least, of the northern parts of India, is to be attributed to ancient and inherent causes, or to modern mismanagement.

Akbar began his reign when thirteen years and four months old, and about five years afterwards freed himself from the tutelage of his old general, Behram Khan. His dominion then extended only to the Punjab, and the country about Delhi, Agra, Gualior, &c. Soon after his acquisition of uncontrolled power he appointed Asaf Khan to the vizaret; and Abul Fazl says that at this time "the jumma of the lands was only computed, and he" (the vizier) "increased the tunkhas just as he thought fit. As at that time the empire was of but small extent, the exigencies of the servants of the crown were accumulating daily; and the tunkhas were levied partially, according to the particular views of corrupt and self-interested people." The meaning of this seems to be, that in the early period of Akbar's reign (and no doubt in the times preceding it), the amount of taxes to be paid by each district was settled by guess, or by computation little better than guess;—that sums due by Government were paid by assignments on the revenues of districts;—that those assignments were augmented to any amount which the necessities of the minister might require;—and that they were levied from the tax payers, with little impartiality or discretion, by the parties holding them, and not by the officers of the state. It should be added that the revenue demand,—the assessment,—was always much greater than the actual receipts. That this was a usual state of things is evident not only from concurring notices of the condition of other parts of India, but by the fact that Shere Shah had found it necessary, some years before, to enter on attempts at reform, like those subsequently undertaken by Akbar, but had failed in them from the confusion of the times.

After eleven years of this state of things, that is, in 1572, the celebrated Hindoo revenue administrator, Todur Mull, was placed in office, with Moozuffier Khan for his colleague: these ministers seem to have immediately entered on plans of reform, but it was not until after another period of fourteen or fifteen years that the requisite data were collected, and the new arrangements were, in any degree, complete. Some of the documents connected with this great "financial reform" were published by Abul Fazl, and are rendered available in the following statement.

To remedy the evils arising from ill-defined assessments, and the practice of issuing assignments on the revenues of districts, Akbar had a settlement effected for ten years; and this measure was followed by an attempt to ascertain what had been the amount of taxes actually paid by the people for several years preceding. The last-mentioned investigation seems to have been carried on for six or seven years, and it resulted in the compilation of tables showing the collection per beega (a land measure) on twenty articles of the spring, and thirty of the autumn crops in each year, from 1560 to 1578 inclusive, in the vicerealties of Agra, Allahabad, Oude,

inquiry; for if taking from India, for all expenses of Government put together, but 5s. or 6s. per head per annum, (not

Delhi, Lahore, Moulton, and Malwa. It is seen on the face of these tables that the assessment was on the crop (not on the land), and varied with the value of it; and it also appears, on examination, that the period subsequent to the appointment of Todur Mull and the commencement of his reform, is distinguished both by greater precision of information, and by lower assessments. The table, as to Moulton, wants the first nine years; and that of Malwa shows the effect of the turbulence of that province and the insecurity of the imperial authority within it, by the lightness of the assessments, and the lumping inexactness of the details.

It happens that of three of these viceroalties, now British Collectorates, viz., Agra, Allahabad, and Delhi, the land assessments of 1845-6 were given in a paper read by Col. Sykes, in 1847, before the statistical section of the British Association at Oxford. The difference in the details of the Mogul and British documents, and of the systems to which they relate, does not permit a very exact comparison; but enough may be learned to lead to a safe general impression as to the relative taxation under the two governments. Confining our view to the rates on wheat, linseed, best and common sugar-cane, common rice, jowary, and hemp, in the years A.D. 1560, 1567, 1573, and 1578, we shall have a fair average idea of the landed taxation of the period; and from these the following facts are supplied.

In Agra, in 1573, linseed paid as little as 2s. per acre, the lowest instance, and with scarcely any other approaching it; best sugar-cane paid 14s. 2½d. per acre. The crops likely to form the great bulk of the produce paid, during the latter or lighter period in the tables, from 3s. to 8s. 2d. per acre. The British taxation of the same district, on all crops alike, and the whole amount of the land revenue computed on the whole of the cultivated tax-paying land, and on none other, varies from 3s. 9d. in Agra, to 5s. 3d. in Etawah, the average being 4s. 4d.

In Allahabad, the Mogul taxation in 1578 was only 1s. 7d. per acre on linseed and 1s. 9½d. on jowaree; but sugar-cane paid, in the same year, 14s. 2½d., and the average on all crops was probably not less than 6s. per acre; the British taxation of 1845-6 was, in Banda, 3s. 1d.; in Futtipore, 5s. 3d.; and, on the average, 4s. 0½d. per acre.

In Delhi, the same exceptional cases of extremely low assessment occur, as 1s. 7¾d. in jowaree, and 1s. 10d. on linseed, the other crops having yielded payments very little lower than those of the two provinces already mentioned, or say, on an average, 5s. per acre. The British land-tax here is, for the lowest, 1s. 2¾d. in Hurreanah, for the highest, 4s. 1¾d. in Paniput, and 2s. 9¼d. for the average.

It is obvious, on mere inspection of the above statements, that in these districts the taxation of the Moguls was considerably heavier, even when under reform, than that of the British; but to give the facts their due weight, it must also be remembered that as every crop was taxed by the native government, while there is only one tax for the year under the British, it would often happen that the same land, growing two crops, would pay two taxes, at the above rates, to one govern-

more than half that of South America, or a sixth of that of England,) is sufficient to keep her down to this hopeless state

ment, and only one to the other. The prevalence of the double taxation is shown by the returns being made in two separate lists, and two estimates and collections being made in the year. If these things be taken into account, it will hardly seem too much to say that the Mogul was 70 or 80 per cent. higher per acre than the British land-tax;—probably double.

But besides these taxes, Abul Fazl says that “his majesty, whose bounty is boundless as the sea, remitted a variety of vexatious taxes which used to equal the quit-rent of Hindoostan:”—that is, I apprehend, the other taxes, previous to this remission, equalled the land-tax. Some of these taxes show, by their names, that they were originally unauthorized exactions for the benefit of the officers, and that they were consolidated, by time, into admitted imposts. It does not seem, however, that they were easily got rid of; for in the instructions to the several classes of officers are repeated injunctions to take care that nobody collected them. In the existing British system of taxation, the other taxes bear no such proportion to the land-tax, I believe, in any part of India: instead of equalling it, they do not amount, in the North-West Provinces, to more than one fourth of it.

When the financiers above-mentioned had made some progress in their work, they constructed a new “distribution” or estimate of the land revenue. This appears to have been only an estimate, and not a document either authorizing or accounting for the actual collections. It would not be possible, without detailed information of boundaries, &c., to institute an exact comparison between this native estimate and the British actual collections: but it may be stated that the former, framed under a strong view of the necessity of lowering the assessments, charges Bengal, Bahar, Allahabad, Agra, and Delhi with 4,923,935*l.*; and that the present British land-tax of Bengal and the North-West Provinces (probably considerably more extensive) is about 7,000,000*l.*: there appears, therefore, some reason to conclude that the actual collection in the one case is not greater *per acre* than the reformer’s estimate in the other;—probably *per head* considerably less. The former demands of revenue had indeed been greater, and the above-mentioned estimate was a reduction, as Abul Fazl expressly states; and a comparison of the earlier with the later years of the nineteen years’ collections before-mentioned would lead us to suppose the same thing: it is still further said that under the Emperor Shere Shah, some thirty years before, the revenue demands often exceeded (as they sometimes do now in the Hydrabad territory) the whole value of the crop.

It can hardly be doubted then, on the whole, that the British land revenue of the provinces just under review, is at least as light in amount as in the best days of Akbar, and probably the total taxation is much lighter. But this was a period of reform, when the intent anxiety of perhaps the ablest monarch who ever ruled Hindoostan, was turned to the subject, and the business was in the hands of men whose names are remembered and honoured, in connection with it, to this day. But at any other period than the best of Akbar’s reign, nearly all the evils which could beset a system of revenue seems to have attended that of these provinces. The

of poverty, her productive powers must be sadly at fault, and we have to look still further for the circumstances which give to so small a cause so great inveteracy of effect.

assessment was so heavy as always to leave large irrecoverable balances,—it was uncertain in its amount,—and it was often collected, not by the state, but by its creditors.

It is always unsafe to reason from one part of India to another; and it is not hastily to be concluded, although it is very probable, that the rest of India was as mistakenly and severely taxed as the Gangetic portion of it, under Mahometan rule. But here we have some reason to surmise that matters were no better elsewhere, both from the fame which is accorded to Akbar, all over India, for the mildness and equity of his government, and from the more specific fact that the regulations of Todur Mu' were spontaneously adopted in states where the Emperor of Delhi had no authority. In system, then, if not in amount, other parts of India confessed to need these revenue reforms of Todur Mull; and some forty years after his date, Mullick UMBER had to undertake a task like his in the Deccan.

If these remarks need any qualification, it is as to the greater severity of taxation under the Mahometan than under the Hindoo Governments of India. I conceive, however, that any distinction on this ground, would apply to times too remote to have any bearing on the purely practical questions which these cursory observations are intended to illustrate. Nor would it apply to the modern period of the Mahratta rule, which spread over a great part of India, and under which taxation was, for the most part, as heavy and as arbitrary as under the Moguls.

Assuming then, as loosely though probably shown, that India paid more to her native than to her present rulers, and paid it in a much worse way, the next inquiry may be, what was her ability to pay it?

Perhaps within the compass of so brief an inquiry as the present, no better comparative gauge of ability presents itself than that of wages in the days of Akbar and at present. Here the ever-miute Abul Fazl is again our authority, and will be a sufficient guide, if we may take his majesty's pay as indicating the usual practice of the time. Bricklayers had from 2½*d.* to 4*d.* per day; carpenters, from 1½*d.* to 4*d.*; sawyers, 1½*d.*; stonemasons, 1½*d.* and 2*d.*; divers, for clearing wells, 1½*d.* to 2½*d.*; bamboo cutters, thatchers, bricklayers' labourers, and lackerers, 1½*d.* to 1¾*d.* Pаланquin bearers had from 5*s.* 9*d.* to 8*s.* 6*d.* per month; the head man of a set of them, from 9*s.* 2½*d.* to 18*s.* 5*d.* The drivers of carriages, some bearing the ensigns of royalty, were paid from 5*s.* 4½*d.* to 12*s.* 5¾*d.*; the head man of ten carts obtained 2½*d.* per day, the other drivers, 2½*d.*; for the repairs of ten carts were allowed 5*d.* 5*s.* 5*d.* per annum. Elephant keepers ranged from 4*s.* 9½*d.* per month to 9*s.* 7*d.*; and horse-keepers were paid nearly at the same rates, while ordinary camel keepers seem to have had rather higher wages: a superintendent of twenty-five camels reached, however, to 1*l.* 13*s.* 6½*d.*, and one of fifty to 2*l.* 6*s.*; but a keeper of a herd of them, probably grazing, had only 9*s.* 7*d.* per month, and his men but 1½*d.* per day. Farriers were paid 7*s.* 8*d.* per month; water-carriers, 4*s.* 9½*d.*; sweepers, 3*s.* 1½*d.*, and occasional men, 1½*d.* per day. Matchlockmen obtained from 5*s.* 3½*d.* to

Turning, then, to the economic condition of the country, it may first be remarked, that every process in India, whether of agriculture, manufacture, or transport is conducted with waste-

11s. 11½d. per month, and their petty officers, from 12s. 5½d. to 14s. 4½d.: foot soldiers, from 4s. 9½d. to 19s. 2d.; and artificers, enrolled as soldiers, from 4s. 9½d. to 7s. 8d. For a horse soldier and his horse were given from 1l. 8s. 9d. to 8l. 12s. 6d. per month. The porters and guards of different classes, of whom some thousands were employed in the palace and the royal tents, had, with their petty officers, from 4s. 9½d. to 14s. 4½d.; watermen on rivers, from 4s. 9½d. to 1l. 13s. 10½d. per month.

With the foregoing we may compare the following rates of wages, from the return of 1847, which relate to the expenses of experimental cotton cultivation in Agra in 1844. Messengers, 7s. 8d. and 10s. 5d. per month; head labourers, 10s. 5d.; ordinary ditto, 7s. 8d., 6s. 9d., and 5s. 9d.; gardener, 10s. 5d.; water carrier, 7s. 8d.; sweeper, 7s. 8d.; watchmen, 5s. 9d.; carpenter, 15s. 4d. and 1l. 1s. 10d.; blacksmith, 15s. 4d. and 1l. 1s. 10d.; hammerman, 10s. 5d., and viceman, 15s. 4d. per month. These different rates, I conceive, will show that the population, in the time of Akbar, were not better able to pay money taxes from wages than they are now.

If I might rely on the few notices available to me of prices of grain at the two periods, and in the same districts, I should conclude that the money value of wheat was not much more than half as great in the reign of Akbar as at present, and, therefore, the money pressure of the land-tax (equal, at least, in absolute amount to that of the present time) was, relatively, greater then than now.

If, then, the taxes were as great in that day as at present, and the people were then no better able to pay them, we may ask a remaining question, not always admitted into inquiries of this nature,—what sort of government did the people obtain for their money?—did it well perform the duties of a government?—did it afford them security?

Akbar began with the Punjâb, and a few districts about Delhi and Agra: after nearly fifty years of conquest and of fighting all over the country, he ended with all India north of the Nerbridda, as far east as Bengal, and much tributary country to the west of the Indus: his generals rebelled in his early, and his son in his later, days: two of his favourite ministers were assassinated, one by a rival noble, in the emperor's own palace, the other, Abul Fazl himself, by Akbar's eldest son. In his instructions to his officers, which, no doubt, were a very great advance upon the practice of the day, he found it necessary to direct that they should take care to prevent private individuals from confining the person of any one, and that they should permit none to be sold for slaves; the collector of the revenues was directed what to do in respect of remission of taxes in favour of places attacked and plundered, and he was told not to be satisfied with pecuniary fines in exculpation of murders and other capital offences. The viceroys were directed how to deal with rebellious collectors of the revenues. His reign was, doubtless, vastly more to the contentment and well-being of the people than any other, for long periods before and after it; but it was evidently as far below our English views of the duties and

ful rudeness; and the product of each process, when brought into competition with the like product of other countries, is almost invariably found to be of inferior quality, so long as it

efficiency of a government, as it was in advance of the Indian practice of that or almost any other day.

What use, then, was made of the produce of the taxes? A few facts only can be noticed. The empire was always involved in war; and immense numbers of armed men were maintained in every province. The numbers of these armed men seem almost incredible, and perhaps no account of them is sufficiently authenticated to permit precise statements to be founded on it. When, however, it is remembered that, according to the universal practice in native India, every man who chose, and was able to do so, kept his own band of armed men, it may easily be believed that the Government also had corresponding numbers to counterbalance them, besides those actually engaged in regular military operations.

Akbar himself was fond of magnificence. His household cost more than 740,000*l.* per annum, besides the military pay of many persons employed in it. To say nothing of his great encampment, which Abul Fazl says it would be difficult to describe, his light equipment for hunting and short journeys required for its transport 100 elephants, 500 camels, 400 carts, and 100 men; its military escort was 500 cavalry, and it employed about 2000 persons. His harem, and every other part of his household, were of like proportions. No doubt, however, his magnificence was one of the means by which he preserved his power; it was at once a gratification and a necessity, entailing vast expense; but arising, as a necessity, out of the state of the popular mind.

It does not appear that, in modes of managing the revenue, much greater unanimity existed then than at present. Akbar himself was ryotwarry; but it seems he found it necessary to say so, in opposition to those who then held to the practice of mouzawarry; for he desires the collector to deal with each cultivator separately and directly, and not through the heads of the village. The heresy of zemindarry does not seem yet to have arisen.

Akbar's instructions to his revenue officers bear no distant resemblance to the proceedings of our own functionaries in the present day. The principal innovations of the British have been the transferring, in Bengal, of actual landed proprietary rights to the zemindars, who were formerly only officers for the supervision of revenue and police,—the substitution of a tax on the land for a tax on the crop,—and the universal establishment of money payments for revenue, instead of the variable practice by which at some places and some times the revenue was collected in money rates, and at others in kind, while in others again, as under Akbar's instructions, the cultivator had his choice of the mode. All these changes have been made through the influence of European ideas: the first is clearly a subversion of ancient usage, and it is to be feared also of ancient private rights; the two latter, notwithstanding the strong opinion in their favour which would almost universally be pronounced in England, are not without serious attendant doubts. In every other respect, there is hardly one of the many

is produced under unaided native management. As an example of waste, take the instance of carriage. Sixteen times as many men, in proportion to load and distance, are employed as in England; fifteen of these are probably waste, occasioned by the rude imperfection of the means of transit; or, making every possible allowance for the comparative inefficiency of labour in tropical climates, eight or ten of them may reasonably be classed under that category. If all the rest of the business of the country is done in a ratio of disadvantage at all approaching to this, it is clear that India produces but a very small part of the annual value of which her population is capable.

That this is no distorted or exaggerated view of the case is evident from the fact that every Indian product, whether cultivated or manufactured, has been supplanted as soon as it has come into contact with those of other countries. The production of common cotton cloths is an example; cotton can be carried to Europe, spun, woven, and sent back again, at a cost which beats the Hindoo on the spot. Take even the most celebrated native fabrics;—a piece of the finest Chunderoe muslin (of the

opinions of the present day on Indian revenue subjects, which had not arisen and been debated, on every side, by the native administrators who preceded us.

The foregoing remarks, drawn from, and chiefly applicable to, the times and the doings of the reign of Akbar, are probably nearly true for the greater part of the rest of India, during at least the last 300 years. Enquiry, it seems to me, would establish almost everywhere the existence of a like state or rather fluctuation of things. Disorder and corruption occasionally interrupted by a reformer, and the reformed condition, while it lasted, not better in point of cost than under British rule, and vastly less efficient for safety, appear to be the characteristics indicated by the scanty notices which historians, intent on wars and politics, have given us of economic India.

These very incomplete observations, on a subject of great interest, and of some importance, are by no means intended to have a bearing, whether favourable or adverse, on any present persons, institutions, or government. Their object is to show that Indian evils have arisen, in all other times as well as in our own, from Indian circumstances; and as those evils have survived all revolutions, aggravated or softened only by mere temporary or personal circumstances, we may conclude, without much risk of error, that, henceforward too, mere change either of governmental forms, or of the persons who administer the affairs of government, whether desirable or not for other reasons, will not suffice to place India in the position which the interests and the philanthropy of England would alike assign to her.

same class as the famous manufacture of Dacca), of only five yards long and half-a-yard wide, costs as much as ten pieces of Scotch muslin, seven yards long and a yard wide, carried to the vicinity of Chunderee itself¹; that is, a fabric, little, if at all inferior, is produced 10,000 miles off, and carried to the spot, for about a twenty-eighth part of the price. Rice, sugar, indigo, and silk, all indigenous products of India, and the ancient objects of her commerce, have undergone the same supplanting. It at once strengthens the argument, and shows that the cause of the supplanting is not in soil or climate, to state that in almost every case, and especially in the three last-mentioned, the place of India in the supply, once totally lost, has been regained, whenever the production has been committed to European management, and has had the advantage of European improvement. To whatever cause we are to ascribe this inferiority of effect in the raising of the native products of India, and whether, as in the case of muslin, it enhances the price, or, as in the case of indigo, silk, and sugar, it deteriorates the quality, the consequences are the same, viz., want of employment and inferiority of remuneration.

And further;—the articles she can best and most cheaply produce, India often cannot export at all from the districts best fitted for producing them, entirely through cost of carriage,—as for instance, wheat, linseed, hemp, cotton, all of which, notwithstanding every disadvantage, may be had cheaply and in great abundance in the interior, but which often cannot bear the cost of carriage to the coast, whether for export or consumption. Wheat, which in Central India commonly bears a price of from 7s. to 10s. per quarter, would cost at present rates 30s. to carry it to Bombay; a fact which precludes the possibility of its being consumed there, and so keeps land wastefully idle which is specially fitted to produce it, and the labour which would be employed in the cultivation.

If, then, we contemplate India producing inferior articles at great cost, and transporting such of them as are good and cheap

by most, expensive, dilatory, and uncertain methods to the sea, or even to their places of consumption within India itself, we shall see, in this enormous misdirection of energy, no inconsiderable cause of her comparative poverty.

But even more;—a great part of the time of the labouring population in India is spent in idleness. I do not say this to blame them in the slightest degree. Without the means of exporting heavy and crude surplus agricultural produce, and with scanty means, whether of capital, science, or manual skill, for elaborating, on the spot, articles fitted to induce a higher state of enjoyment and of industry in the mass of the people, *they have really no inducement to exertion beyond that which is necessary to gratify their present very limited wishes*; those wishes are unnaturally low, inasmuch as they do not afford the needful stimulus to the exercise requisite to intellectual and moral improvement; and it is obvious that there is no remedy for this but extended intercourse. Meanwhile, probably half the human time and energy of India runs to mere waste. Surely we need not wonder at the poverty of the country.

Much of the scanty capital of the country is locked up in unproductive forms. In England we are so accustomed to consider capital—accumulated savings—merely as a reproductive source of income, that we can hardly conceive of the motive which commonly induces the natives of India to lay by their savings principally in the form of jewels or coin. Such, however, is the practice. Probably it originated in the facility with which wealth in these forms could be concealed in times of insecurity and turbulence, or from the knowledge of grasping sovereigns or officials; in the case of feudatory nobles, often at variance with the sovereigns, with each other, and with the neighbouring states, it was probably felt to be necessary to have always in hand the means of taking the field promptly, in aggression or defence: and men of even much lower standing, had not that security from private wrong and official oppression, which would permit them to dispense with precautions for resistance, concealment, or flight. Even yet, the habits which

originated in the former state of things have not given way, under the more quiet and regular rule now established in most parts of India; and not only do persons of very moderate incomes still possess large amounts of jewels, but I heard, on the best authority, at Poonah, that in the houses of the Mahratta sirdars there, sums are hoarded, in actual silver, varying from seven to nineteen lacs of rupees (from 70,000*l.* to 190,000*l.*) in each house. These facts are rendered the more remarkable by the high rate of interest which might be obtained on these hoards, if set in action: legal interest is nine per cent. per annum; soucars and banians readily obtain several times that amount from needy cultivators. To point out such facts is to indicate one immediate cause of the poverty of India.

If anything, beyond the continuance of a higher degree of public and private security and order, can tend to rectify this error, it must obviously be that greater commercial and industrial activity which could not fail to follow the establishment of better means of transit: and perhaps nothing could so draw out those hidden means of advance, as enterprises affording a proved and safe investment for profit, without requiring personal attention or interfering with the distinctions of station or the usages of caste. Although the effect might not appear at first, it seems hardly possible that a successful railway should long run through a district, and leave unmoved these useless and barren accumulations.

India has suffered in an aggravated degree, and down to recent times, the vast evils of war, insurrection, and all forms of violence. If we fix on almost any point in the map of India, and learn how often in a century armies have passed it, or its rulers, supreme or subordinate, have quarrelled about it, or its people have fallen out amongst themselves, we shall cease to wonder that India is poor.

Whoever will reflect on the longing for action which is inherent in human nature, which, rightly indulged, is one of the main springs of improvement, and which in some individuals, leaders of the multitude, breaks out into activity under every disad-

vantage and for almost any object, will easily see how the limited occupation of a vast population induces turbulence and war. In Britain, our fuller employment, even if at times necessitated by a pressure beyond our liking, probably saves us from the scourges under which India, in the hands of its native governments, has ever suffered; and a course of action which would open new sources of interest, and present better objects of ambition, is perhaps amongst the most likely subsidiary means of finally abolishing that tendency to violence, which the unemployed multitudes of India, under their natural leaders, have constantly exhibited, and which the vigour of government in the British districts, aided by the growing confidence of the people in this effect, at least, of our rule, has in so successful a degree repressed. It is not unreasonable to hope that the natural energies of Chectoos and Kureem Khans, with better objects in view, may be exerted hereafter in capacities calculated to bring honour to themselves and advantage to their countrymen; and that even Doongur Singhs and Ragojee Bangrias may find appropriate and praiseworthy places in a more active social system. Meanwhile it remains true, that the violence of past days is one cause of the poverty of India.

The consequences of the famines of India to the absolute amount of the wealth of the country are too obvious to need remark; but the effect of them on the manner in which that wealth is distributed amongst the people, requires some notice. The utter destitution often occasioned by these calamitous seasons, sweeps everything into the possession of the money-lenders; and, roughly speaking, the agricultural population has to begin the world afresh for this reason every 10 or 15 years. Why famines should be so peculiarly injurious in India is easily told. All countries are liable to periodical variation or failure of crops; but these failures are commonly more or less partial and limited in the area which they chiefly affect. Where the means of conveyance are cheap and abundant, that which would have been a famine, resolves itself into such an increase of price as will pay the cost with profit of transport of grain from

districts were plentifully supplied. We do not suffer from famine in England because we can pay for bringing food from any distance by the very efficient means of carriage we possess. But where, as in India, no price will pay for the transport, and often at the time of the year when the scarcity is most severe, no effort whatever can effect it, then a failure, or even scantiness of crop, becomes a real famine, and many of the people must migrate to the food or die¹. Now as scarcity in India, although not unfrequent, is almost invariably partial, to establish good and cheap means of transport, fully available

¹ "Having had the control of all the arrangements made at Agra during the last fearful famine, I may instance a fact which will convey a more accurate idea of the condition of the country, and the position of the merchant and consumer, than anything I could urge. Coarse grain was selling at Agra at five and six seers the rupee; there were upwards of 60,000 paupers at Agra, besides 37,000 in the division, dependent on the bounty of Government, and the Government devolved on me the duty of employing and feeding the whole; the demand for grain to feed these paupers, at Agra alone, was about thirty tons per diem; the cattle, by which the grain was to be brought, were incapable of travelling, and dying from want of forage. At this very time best grain was selling in Goondwana at forty seers, or a maund, for the rupee, and from thence I endeavoured, through the late Mr. Wilkinson at Sehore (Bhopal), to procure a supply, and to attract the merchants by a knowledge of the prices ranging at Agra, to import. It was found impracticable, as, in the mere feeding of the cattle employed, half the supply of grain was consumed *en route*, there being, owing to the drought, no forage to sustain them on the journey.

"Had a railroad from Bombay to Delhi existed, this very grain of Goondwana would have been brought to a railway station in the valley of the Nerbudda, or to one near Indore, and carried thence to a point near Alwah, about fifty miles from Agra; from whence we should have drawn our supplies, whilst the north-west provinces would have had a depôt at Delhi.

"But, independent of the supply of food that the railroad would have brought, it would have afforded to thousands an opportunity to escape to a cheaper country, and to transport themselves to localities where the means of subsistence, and the want of labourers, would have ensured them a maintenance."—*Extract from a Letter of R. N. C. Hamilton, Esq., Resident at Indore, to J. G. Lumsden, Esq., Secretary to the Government of Bombay, 8th Sept., 1848.*

If the rupees and seers, as is likely, be the Indian, of say 23d. and 2'057 lbs., and the distance between Goondwana and Agra be taken at 400 miles, the above statement shows that a difference of price amounting to 9d. or 10d. per mile of the distance was not sufficient to overcome the difficulty of procuring grain to stay the horrors of famine.

throughout the year, is to put an end to famines, and with them to one of the most powerful causes of the bondage of the cultivator to the money-lender. And I judge that this is the *only* means of relieving India of the recurrence of famine; for the consideration to which I have before adverted, viz., that however fertile a country may be, the area sown is not determined by contemplation of failure, but only by the probability of consumption or sale, shows, it seems to me, that no measures which merely increase the productive powers of the land, can prevent famine: on more prolific land, without an outlet for the surplus, a smaller breadth would be sown, and the failure comes too late for local remedy¹. Accordingly some of the most frightful famines on record have happened in the most fruitful countries. With railways famines could no more occur in India than in England.

Most of the evils which have just been discussed have been attributed to taxation, and particularly to the land-tax. I do not undervalue sound principles and judicious management in the raising of the public revenue; but I venture to doubt

¹ Candeish, of which I have already quoted (note to page 97) the great and ruinous plenty for some time up to 1846, suffered, in that year, a partial failure of its crops, and had to import corn largely from Goondwana. The Gunguthurree, one of the most fruitful districts of Western India, suffered greatly from the same cause at the same time, and many of its inhabitants had to leave their homes in search of employment and food. These are only instances of what is happening at intervals of a few years in the most prolific districts of India.

An instance in which this same district, Candeish, is concerned, may serve to show the difficulty and expense of conveying food where most needed. The province was subdued, in 1818, by Maj.-Gen. (then Captain) Briggs, and was tranquilized by the same officer, who also resided in and managed it down to the period of the occurrence I am about to relate. In 1823, when it had had a few years of security and rest under our government, and the revival of agriculture had been perhaps unduly stimulated by Government advances to the cultivators, grain sold at 100 seers per rupee, or about 50 lbs. for 1s.; in Poonah, at the same time, the price—a famine price—was eight seers per rupee, or 4 lbs. for 1s., and people died in the streets from want. The distance is such that the difference of price would have admitted a charge of 1s. or 1s. 2d. per ton per mile for carriage; but, from natural difficulties, no carriage could be effected, and the ruinous plenty of Candeish could not, on any terms, be brought to relieve the deadly scarcity of Poonah, only 180 miles distant.

whether that view of Indian questions is sound, which begins with this subject. Taxation in India amounts to so small a sum per head per annum that the more important inquiry may well seem to be, not, why is taxation in India so great, but, being so small, why is India so little able to bear it? Why does so small a charge for Government as 5s. or 6s. per annum press so heavily as is alleged upon the people, while 2*l.* per annum, the rate in England, leaves ample room for accumulation, as is witnessed by our rapid growth of capital? Nor even relatively to the tax-paying power of the people does it seem much easier to account for the depressing influence attributed to Indian taxation; for the amount of tax there per head bears not a very different proportion to the earnings of labour from that in England, being, for each person, about one-fifteenth of a common labourer's wages in both countries¹.

While these doubts rest on the actual effect of the taxation of *British India* (and that of no other part of the country is under our control), there can be no doubt that the remaining effects of former times of insecurity, the present inefficiency of labour, the absence of knowledge to direct that labour, and especially that particular form of these evils which is seen in the barbarous rudeness and enormous cost of its means of carriage, are amongst the true and most influential causes of the poverty of India. Without, then, questioning the justice or good policy of improved modes of assessment, and still more without deny-

¹ This results from the following figures, which each reader can correct, if he think needful, for himself.

Gross taxation of British India, in 1845, 22,074,768*l.*

Population paying it, about 70,000,000.

Average wages of common labourer or servant throughout British India—say four rupees per month, or 96s. per annum.

Gross taxation of the British Isles, about 55,000,000*l.*

Population, by last census, 27,618,668.

Average wages of a common labourer throughout the British Isles—say 12s. per week—31*l.* 4s. per annum.

The argument affords only a rough, but perhaps sufficient approximation to its object, viz., a comparison of the taxation with the tax-paying power of the two countries.

ing that over-assessments in particular districts, charged with more than their due share of the public burdens, have wrought great misery to the people of those districts, and great disadvantage to the Government, it still seems to me, that it is not from a diminution in the general amount of taxation in India that relief and advancement are to be chiefly expected. The proportion which taxation bears to the total means of the people is evidently too little to admit of any saving out of it (however just or proper on its own grounds) which could effect that radical difference of condition which India requires. If the cost of governing India could be reduced one-half (which I apprehend is beyond the imagination of the most urgent economist), the result would be trifling in comparison with the strength to bear the whole which cheap and ample means of transit would impart; and I cannot but think that the efforts of the friends of India would be directed with greater effect to the increase of its industrial efficiency, than to the diminishing of its taxation.

Nor is it to be forgotten that the amount of taxation is not a matter to be regulated altogether at will: it depends on the moral condition of a people, on their local distribution, and on the pitch of excellence to which their order and security are to be provided for. A gaol of unemployed prisoners is governed at the cost of their entire maintenance, paid by the rest of the community; a body of Quakers, or other out-acting Christians, costs the country very little. In a nation of escaped convicted burglars, if such could exist, it would probably cost the whole value of their fitful and necessitated labour to maintain their internal quiet; a country of just and peaceable men would be governed for a very trifling proportion of their annual produce. Between these extreme points of the scale are the various nations of the world, amongst which it can hardly be said that India would stand the highest. At present, that great land, paying in taxes much the same proportion of its income as we do, enjoys, on the whole, only a lower degree of security; and if we were to insist on that empire being governed up to our English

ideas of rightfulness and propriety (as, indeed, we ought to insist on it, as far as it can be brought about), I fear that the real difficulty of Indian finance, would be found to lie not in zemindarry, or mouzawarry, or ryotwarry, but in the large proportion of its income which the cost of so governing the country would absorb;—a difficulty which must exist until sounder principles of social morality shall influence large classes of its population. Meanwhile, to lower materially the cost of government would probably be to lower its efficiency, and to lead to greater loss from diminished security and order, than gain from diminution of taxation. If so, the true course is to strengthen the paying power of the people, that the needful expense of government may be easily borne, not to bring down the cost of governing, and so reduce to a still greater extent the power of paying it.

Happily there is already established in many parts of India, under British rule or influence, a degree of security quite sufficient as a basis for all further improvement. Neither public works nor private undertakings, if managed with ordinary justice to the natives concerned, and sincere good-will in respect of their feelings, need fear greater interruption, or would be exposed to greater danger, than such enterprises have encountered in many countries; and in whatever India may fall short of the pre-eminent order and public security of England, it is making, I believe, constant and not insignificant advances towards the same point. Enough is done in the principal (let me say *sole*) duty of the Government, the maintenance of right, to afford ample space, protection, and inducement, to the efforts required for all further progress; and every step in that progress will add not less to the facility of the next step, than to the effect of all that have gone before. While the peace-keeping office of the Government has been so executed as to give room and safety to railways, we need only our European experience to assure us how railways will, in turn, aid the Government in the discharge of its own supreme functions.

It is scarcely possible, I trust, that the views I have now

expressed, respecting the taxation of India, should be so misunderstood as to imply a justification of any tax, or scheme of taxation, now existing in India; they refer exclusively to the relation of the gross amount of taxation to the general interests of that empire. For aught this argument says to the contrary, there may or may not be great errors to be rectified, great extravagance to be curtailed, or even great abuses to be reformed: its purpose is to support my belief that the taxation of India is neither the deepest, nor the greatest, nor, I am happy to add, the most remedial of its evils.

Leaving, however, these general speculations, which have no further concern with cotton, than as the subjects of them are alleged to relate to it through their influence on the general condition of the natives of India, it is necessary to remark, that as to much of the cotton we might derive from that country, neither the land-tax, nor any other tax, is a question within our power. The country to produce that cotton is, in great part, under the Governments of the Nizam of Hyderabad and the Bhonsla or the Raja of Nagpoor. The management of the latter is well spoken of, and the affairs of his country afford us what is, unhappily, in the present state of India, the best evidence of order and quietness, very little news. The territory of the first-named prince is the prey of disorder and extortion¹;

¹ The case of the pergunnah of Indapoor, in the collectorate of Poonah, may be adduced, not that it is peculiar (for much of the Deccan was in the same state), but because its details happen to be known. In the period preceding the fall of the Peishwa, the imposts of the Mahratta Government were made more than usually excessive and irregular under pressure of the difficulties of the day. Whether these extra burdens, when they reached the cultivator, were restricted to the due measure of the wants of the state, or whether all that was collected became available to the state, subsequent events may enable us to judge. On the country coming into the power of the British, in 1817, the exactions of the fallen native Government were continued, in a consolidated and established form, with some insufficient modifications, and its revenue affairs were entrusted to some of the few English officers at the disposal of the Hon. Mountstuart Elphinstone, to whom, as Commissioner, were confided the powers of the government. These officers, chiefly of the military service, were able men and good linguists; and some of them had carefully investigated the history and institutions of the country; but they had not

~~and in this state we have a living and remarkable instance of the effect of oriental principles of government, which, in fact,~~

had the practical management of revenue arrangements. So scanty was the number of officers employed on, or perhaps who could be spared for, this service, that the country from Jooneer to Sholapoor, 180 miles long and 50 broad, was committed to a single functionary, who was Judge and Magistrate, as well as Collector. The consequence was, that all the local and detailed management of the revenue was left in the hands of native subordinates, some of whom held hereditary offices, and many of whom had been employed under the former Government in the worst of times: and these, while they had much larger charges than they could probably have honestly managed, did not fail to profit by the want of adequate supervision. The people suffered great oppression, and sometimes even torture, from officers who were too often their neighbours and townsmen; and the public records of subsequent judicial proceedings I believe will show that, while, on the one hand, these officers extorted payments beyond the means of the cultivators to afford, on the other they purloined more than half the receipts. If to these native evils, of old growth, we add the errors inseparable from the working of the inadequate and half-informed establishments of a new and foreign Government, we shall not be surprised that the country people found themselves worse off during the first years of our power than they were before. Numbers of them deserted their lands and even betook themselves to the Nizam's country, which, badly governed as it was, seemed an asylum in comparison with their wretched homes. An attempt at remedy, by granting leases of land for a term of years at fixed rates, did not succeed; for the information on which it had proceeded was incorrect and imperfect, and the agency by which it was to be carried into effect could not be relied on: and, afterwards, the great value of Mr. Pringle's Revenue Survey was utterly destroyed by the corrupt unfaithfulness of the native agency to which the management of details had been entrusted, and especially of a learned native, its chief officer.

A better system, however, gradually established itself. The immense district formerly committed to one officer was divided between two, and each of these had several qualified European assistants, besides native aid which had been trained, often to excellent purpose, in a better school; the appointment of judges and magistrates gave over the Collector to his more appropriate duties; and the revenue proceedings of the whole presidency (and afterwards of its half) were subjected to the examination of a Commissioner, qualified from experience to pronounce on the merits of each local management.

In the course of his duties as Revenue Commissioner, Mr. Williamson Ramsey had to undertake the case of Indapoor, and with his assistants, Mr. Goldamid and Mr. Frere, effected in it a thorough reform. The malversations of the local officers were investigated, and many of the offenders were subjected to judicial trial and punishment—the rates were greatly reduced and rendered certain—the cultivators were secured against illicit exactions—the native part of the revenue establishment was not only purified, but raised in numbers and efficiency much nearer to a level with the

amount to despotism held in check by rebellion. Here the British guarantee of the throne to its possessor, without any

duties required of it—and the excellent revenue survey made under the superintendence of Lieut. Wingate gave accuracy and permanence to all proceedings. The results may be seen in the following letter from Mr. Frere, the present (or late) very able Commissioner of Sattara, to Mr. T. Williamson Ramsey, late Revenue Commissioner of the Bombay Presidency.

“Camp, Phultun, Sattara Districts, Dec. 13, 1849.

“It is now just fourteen years since you picked me up there (in the Indapoor District), after I had served my apprenticeship under Goldsmid, and I could not have believed that the period could have done so much for what was then the most miserable district in the Deccan. It, of course, still continues one of the least favoured by nature—barren in soil, ill watered, and uncertainly and scantily supplied with rain; but these natural drawbacks have been, as far as possible, neutralised by good administration. You may remember that, in 1834, full two-thirds of the land were waste; now there is not a field uncultivated, unless purposely kept so for grazing. The tillage was then most imperfect and slovenly; it is now equal to the excellent cultivation of the Krishna valley, and far superior to that of the Sattara villages on the south side of the Neera, which, in 1834-5, were far superior to Indapoor. The difference is most marked this year, which, from unprecedented deluges of rain, has been most unfavourable. Here (Sattara) there are no crops in many villages; the seed rotted in some fields—the young plants were choked with weeds in others. Throughout Indapoor, with precisely the same drawbacks, there are crops to feed the people and pay the rent, though gained, I was told, by great expenditure in labour and often in seed, some farmers having sown the same land four times over before they got the plants to come up and thrive. But this high farming, for it is nothing else, the effect of having plenty of cattle and money at command, and heart, has carried them through a bad year. They will, though with difficulty, pay their rents, which cannot be done here. In no single village did I fail to observe the recent marks of prosperity in new and newly-built houses, some two attics high; tenuples, village walls and gates, chowrees, &c. Three villages, which I remembered waste and uninhabited, were thriving, and numerous hamlets had sprung up. The great money lenders complained that there was no trade; but on inquiry I found that it was the trade of money lending which had fallen off. The ryots are so well off they are tolerably independent, and either do not want to borrow, or able to get it on reasonable terms, without submitting to extortion: 9 or 12 per cent. instead of 12 and 50—a great change. The number of shops had marvellously increased; Indapoor bazaar was at least double its former size, and Kullus, which used to be a decayed market town with one shop, has now twenty-three. In 1835, or later, there was not one cart with wooden wheels in all the district; the stone-wheeled manure carts were very rare. Now, standing at the Indapoor town gate, I counted upwards of a hundred attending the bazaar, and saw

corresponding British influence in his councils, has deprived the constitutional check of rebellion of much of its customary force; only, however, to remove the struggle from court to country, from the sovereign and his nobles, to the officers of the farmed revenue, and the people they plunder in the name of taxation. The farmer of the taxes and his subordinates exact all they dare, and the subject pays no more than can be forced from him. Meanwhile every mail brings intelligence of the pecuniary distress of the Government, and the consequent impotency and disorders of the unpaid troops, of the insecurity

some in every village. But the most marvellous change was in the people; from being the most wretched depressed set in the Deccan, they have become thriving independent fellows, and thoroughly grateful for what has been done for them. When it was known I was coming, they turned out in crowds, delighted to see again any one connected with the reassessment, and doing all in their power to show how glad they were to see me. The district officers, whom you examined when first you wrote about the state of the country, asked much after you, and took me to see the house where you visited them. I was overwhelmed with questions about Goldsmid; and every one had some anecdote to tell, or something to ask, about Goldsmid, who runs a good chance of being manufactured into a popular village deity, and taking the place of Mahadeo, or even Marotee. I felt quite convinced that it would be no easy matter to hatch a rebellion there. In fact it convinced me more than ever that our hold on the people of the Deccan is our revenue administration, and the effect is not confined to our own districts,—it is felt here (Sattara), and is, I am satisfied, the most effectual if not the only counterpoise to the discontent of the upper classes. I have seen it particularly since the annexation. The upper classes are evidently either sulky or suspicious, and a spark would set them in a blaze; but the lower orders everywhere hope that our liberal measures, in reducing assessments, &c., will now soon reach them. They always ask me about it, and often say, ‘We have had many good rulers of our own, but the Company is the only Government that ever voluntarily reduced its demand to the limits fixed by the shasters.’ Perhaps the most satisfactory feature about Indapoor is that, except for the first two years of Goldsmid and Mansfield’s administration, the district has had no special advantages. The whole is the effect of good administration, which it has shared with the rest of the collectorate.”

I will only add to this animated description of the advantages Indapoor has derived from judicious assessments, with kind and honest treatment, that the increase of the population was evidently due to the return of those who had emigrated, and to the incoming, probably, of many more from the neighbouring districts, and that the well-being and gratitude of the people would be promoted, according to all experience, in a still higher degree by the establishment of those improved means of internal transit of which the writer of this letter is one of the most earnest advocates.

of life and property in the capital, and of the uncertainty and discouragement which embarrass every legitimate interest. Still the country, wretchedly governed as it is, gives us cotton at 1½d. per lb., land-tax included; and we can hardly expect that any improvement in the administration of its affairs will bring its cotton much below that price, however that improvement is to be desired for the sake of the people.

General allegations of misgovernment are not unfrequently made against the East India Company; and it is further alleged that this misgovernment accounts for the paucity of cotton. After some inquiry, begun under the same impression, my belief is that these allegations cannot, in general, be sustained, although, doubtless, instances may be adduced in this, as in all extensive systems of management, which not only induce regret, but require serious and heavy censure. This is not the place to account fully for the existence of a different opinion; but I may remark that one of the chief occasions of it has been a forgetfulness of the fact, that the British Government had to take charge, successively, of the parts of the country now forming its empire, when each had long been subject to modes of taxation far from anything we should approve, and often almost as far from the ancient usages of the country,—when, to the corrupt interests established, and to the oppressions brought to be acquiesced in by this long misgovernment, was added the confusion occasioned by the corruption and feebleness of falling governments,—and when all this had been aggravated by immediately preceding war. Time and caution, even in reforming, were rendered pre-eminently necessary by the known submission of the natives to all that was customary, and their frequent resistance of all that seemed to be new¹: and what-

¹ This tendency of the natives may be illustrated by the origin and nature of some taxes abolished of late years. *Ghas-dana*, or forage money, was an impost established without public authority, and for their private benefit, by the officers of the Mahrattas on their first inroads into neighbouring states early in last century; it became a usual payment to the state or its officers, and was found as such on our entering long-after on the government of the same countries. *Kusub veras*, as the

ever we might intend or wish to do, we had only native agency, unused to European views, for carrying it into effect. Our countrymen, actually employed in governing the natives, are ludicrously few in India, probably not one to 50,000 of their numbers, or say eight to the population of a medium English county,—and we in England often require, not merely such reforms as shall restore or purify native usages, but such as shall place the entire administration on a basis not of Indian but of English principles'. And when we ask (as we ought indeed to wish and to strive) that our Government in India shall conform, at least in purity and efficiency, to English ideas, we forget that we have little more than native opinions, experience, and instrumentality, with which to work out reforms, and to give stability and effect, or even admission, to any such

name imports, were originally exactions from any man of property or skill above his neighbours, and beyond the ancient taxation. A tax of this kind could easily be enforced in a country where the officers of the Government had unlimited power of imprisonment. These, also, from individual and private exactions, became, in time, admitted taxes. *Balootee* and *Mhoturfa* taxes were imposts on tradesmen and artisans; their great inequality in different places, however, gave them much more of the aspect of arbitrary exactions than of taxes regulated and levied by public authority. All these kinds of taxes, and perhaps some others, were found established and submitted to on our entrance on the government of Western India; but they were in time reduced, by the British officers, from fluctuating and uncertain exactions to ascertained amounts, founded on past actual payments in each place, which, however, had still the fault of being different in different places. In this form, perhaps then the only practicable one, the needful revenue was raised at the time; but, in 1844, these taxes, in the Presidency of Bombay, were all abolished. The readiness with which, notwithstanding their oppressive nature and tyrannical origin, these imposts were submitted to, because established, contrasts singularly with the resistance made to an increase of the salt-tax which was to accompany their repeal, and still more so with the celebrated turn-out of the entire population of Benares, against a municipal tax for the cleansing and well ordering of their city.—A tax on widows existed in the Concan, of which I have not learned the origin.

¹ "I always dread changes at the head of the India Board, for I fear some down-right Englishman may at last get there who will insist on making Anglo-Saxons of the Hindoos. I believe there are men in England who think that this desirable change has been already effected in some degree, and that it would long since have been completed, had it not been for the Company's servants."—*Sir Thomas Munro to Mr. Canning, 30th June, 1821.*

operations on the mass of the people. But, on reflection we cannot but see that reform in government can in India only be slow, and must chiefly be based on whatever, by usage, already exists¹.

¹ *The practical importance of an intimate knowledge of the peculiar institutions of India, and the usages and feelings of its people, is exemplified in the incidents of the occupation and tranquillization of Candeish, by Captain (now Major-General) Briggs, at the close of the Mahratta war, in 1818. No less do the same events show the alacrity with which the people, harassed with wars and extortions, assisted of themselves to establish a government which, though that of foreigners, seemed likely to bring with it a better state of things.*

In the wars which, from 1793, had raged between the Peishwa, Scindirh, Holkar, the Raja of Nagpoor, the Gaikwar, the Nizam, and sometimes the British, in which all sorts of combinations and oppositions of the parties succeeded each other by turns, Candeish, centrally situated, was often traversed on the great marches and retreats of the contending armies. Its sovereignty belonging, in name at least, to the Peishwa, it suffered greatly from the same rapacity of revenue farmers (each farmer often in possession but a year) which inflicted so much misery in Indapoor, and indeed in all the rest of the Deccan, during the rule of Bajee Row. The weakness of the Government, which thus excessively taxed its subjects, was such that no less than thirty-two lawless but organized armed bodies established themselves at different times in the province, living on the contributions which they exacted from towns; and the greatest of these bodies was that headed by Bajee Row, afterwards himself the Peishwa.

Into this harassed province, which is 12,000 square miles in extent, and contains 1500 villages and 36 forts, was Capt. Briggs sent with 1300 troops, of which at least four-fifths were natives, and two guns; 1500 native horse were afterwards obtained, who a few months before had been fighting against us, under the standard of Holkar. Capt. Briggs, with some valuable native aid, was at first alone, as a European, in the civil government of the province, and obtained a single assistant only after some months. The people welcomed him; but an appearance of resistance was occasioned by bodies of disbanded soldiers, from the dispersed army of Holkar, who were traversing the country and subsisting by plunder, and also by a band of Arabs who had long so maintained themselves in the province. The former were soon rendered not only harmless but useful, by being taken into pay as local troops, and employed to garrison the forts as they successively fell to us; the latter still attempted to continue their rapine, but, under encouragement derived from the more hopeful times, they were gallantly resisted by the population, bravely and faithfully aided by Holkar's late horse; but they were only subdued finally by the capitulation of Malligaum.

One of the most serious annoyances, however, was that of the frequent descents of the Bheels from the neighbouring hills, to ravage the country, or to levy black mail. It was found, however, on inquiry, that these people were the customary

The subjection of India to England is a very remarkable case, being, in truth, the government of a people, not as in other cases by its own public opinion, but by the more advanced public opinion of another country. Hitherto the public opinion of England has, for the most part, exerted itself on the affairs of India, through the selected agency of the few who have officially devoted themselves to those affairs; these men have carried the general impress of English opinion and feeling into measures which, in detail, few English besides themselves have understood. This arrangement, while it has to some extent prevented the

watchmen of the villages; but that finding, in the confusion of the times, that the lands they held for the service had become valueless, and that the usual additional money payments could not be realized from the impoverished cultivators, they had betaken themselves, some years before, to the hills, and had become the scourges of the villages they used to protect. These, however, on being reinstated in the lands and offices which had been vacated for twenty years, became again the police of the district, and served well in that capacity.

Thus the natives themselves contributed nearly the whole of the force which established the British rule in Candeish; and the confidence and co-operation of the people were gained by the unmistakable intention of the British Government to restore the order and security of which they had so long been deprived.

The revenue affairs of the province were, in like manner, chiefly administered by means of the natives themselves. Surveys were made after the rude native fashion; the amount to be paid by each village, in future, was settled at the average of the preceding ten years, and the details of its distribution amongst the inhabitants of each village was left to be settled by their local officers and by mutual agreement. Such a supervision as so small a European establishment could afford was diligently employed, so as to fall unexpectedly on different and distant places, and, together with publicity of investigation on the spot, contributed to keep up some degree of order and faithfulness in all. Instances, however, were detected of peculation and extortion, and these were followed by compulsory restitution and deprivation of office. The people were also interested in the administration of justice by the occasional use of punchayets or juries, by which the investigation of facts was often conducted with a success which only native knowledge could have secured.

By these means, which could only have been employed as the result of careful inquiry into native institutions and usages, the province attained to a degree of order which, if not in accordance with systematic views formed in more regular times, at least contrasted to great advantage with the state of things that immediately preceded it. From that period Candeish, I believe, has enjoyed a time of quiet and security in which former violence has been almost forgotten, and, in the thirty-two years which have elapsed, has advanced to such prosperity as the want of sufficient markets for her produce has permitted her to attain.

precipitancy and change which more direct but less informed action might easily have induced, and which would have been *far more injurious than delay*¹, has so far sufficed as to give to the English Government of India, at every particular period, very nearly the same character and qualities, whether for good or evil, as the English people and their own home government possessed at the same time; and this, I apprehend, is all that, in the nature of the case, was possible, however we may now wish that more and better had then been done. The time may come, perhaps is coming, when the indirectness and exclusiveness of this system may be advantageously abated, and the disadvantages of its bureaucratic character mitigated. It must be remembered, however, that no mere fiat of the Imperial will, popular or governmental, however well intended, will work for India, or even for ourselves, the benefits we have a right to desire; nor will the best advised measures of reform take much effect in India, except they be accompanied by such improvements in public opinion, or at least in general feeling, *there*, as shall give them silent liberty of operation, if not active support. Here, as far as may safely be, popular opinion and sentiment must be brought to the aid or correction of official views,—there, the very basis of enlightened public opinion has for the most part yet to be laid; but meanwhile a universal sentiment, or rather even a state of mind, almost, at times, without either sentiment or opinion, strews difficulties and perplexities in the path of improvement, and seldom affords countervailing aid. On both sides is wanted more intimate knowledge of present facts, of what is to be done, of the means of doing it, and of the results to be anticipated. In England it is rare to meet with a man who can even ask an intelligent question on any point involving Indian

¹ It is worth inquiry how far the exemption of the Hindoos from the fate of the Red Indians and Mexicans of America may have been promoted by the defects, circuity, and weakness of our own Government; and whether the ills attendant on its weakness (and many a grievance is to be classed amongst them) have not been *valle*r than those which might have followed its strength.

economics; while in India the mass of the people hardly yet look to us as the agents of great and elevating measures, but merely as conquerors, better, indeed, in some respects than our predecessors, and on the whole to be willingly and advantageously submitted to, but conquerors after all. Englishmen must be far better acquainted with Indian affairs and peculiarities than they now are, and the natives of India must be brought to understand, appreciate, and support the changes which the intelligence and experience of England would counsel and promote. While these preliminary and fundamental reforms are taking place, and in as far as at any time they may remain incomplete, there is no little risk that the best intended dictates of English public opinion on Indian matters will be far wide of the mark or positively hurtful, and in India nothing can be done for the improvement of public opinion and of all which depends upon it, beyond the efforts made by the best of the European officers and community, aided by the small but growing numbers of natives, private and official, who are like-minded with them.

The true basis for all other improvement of the Government of India lies, therefore, I apprehend, not merely in administrative changes, however desirable, nor in the amendment of particular laws and systems, however urgently required; but in the constant and intimate intercourse of the people of the two countries, whereby the public opinion of England may become better informed, and that of India better prepared to receive, consider, and act on advice; and it seems to me that by nothing short of real interests, and the intimate and familiar knowledge of facts arising out of the working of them, can these great changes ever be effectually made, or, to their rightful extent, ever be made at all. When, therefore, on one hand, it is alleged that misgovernment exists in India, and I admit, on the other, that great improvements are required, I feel bound to urge that the chief practical remedy is to institute such facilities of intercourse as shall occasion the formation of that public opinion, both in England and India, which is essential to the real

strength of the Government as well as to the safe devising and practical success of any Indian reform.

If we look, as well we may, to education, as one means of forming an improved public opinion in India, we must remember that the mere teaching of youth, although indispensable, is not enough even for the preservation of knowledge, to say nothing of the formation of opinions and character: opportunities for and inducements to the use of that knowledge are as essential as the first communication of it. It may fairly be said that the presidential cities of India (perhaps, however, I ought only to speak of Bombay) are, in a certain sense, over educated: knowledge is given to some which is afterwards lost for want of opportunities of using it, of which instances in Bombay came, more than once, under my own eye. Now, without relaxing our efforts for the extension of education, it appears to me that we have arrived at the period when it has become still more important to afford occasions for the use of the knowledge which we impart; and nothing, it seems, can at present so soon or so fitly afford these, as the construction and management of great public works of communication, and the prosecution of the augmented industry and commerce, which must follow their establishment. Then, it may be hoped, that education will be felt, by the large classes of the people themselves, as a want, and the acquisition of it will be its own reward; while public opinion improved by the same means in strength, diffusion, and purity, will afford, to just and beneficent reforms, that support from indigenous intelligence, which has hitherto been derived mainly from a foreign source.

I must emphatically disclaim every interpretation of what I have said, which implies disparagement of the capabilities of the natives of India. As a people, they have not knowledge, but many amongst them have shown themselves highly capable and desirous of it; they have not, in sufficient numbers, mechanical skill, but some of their countrymen have produced admirable works, and every day may be seen, in the government establishments at the presidencies, the great dex-

terity and correctness they may be brought to acquire ; they have not a history whose traditions can inspire them with worthy emulation, but those who have learned of us gladly enrol themselves as partners of our destiny ; according to our better lights, they have not a sound system of morals, or a faith capable of sustaining one, but they have some virtues of a lustre strangely inconsistent with their vices, which show how capable they may one day be of better things. They need our teaching, our aid, and our fellowship ; and well will they repay us for them. One error, however, I conceive, we cannot too carefully avoid : we shall fail greatly if we imagine that any government, however well-disposed, is a sufficient medium of communication between the two peoples. Interest to interest, almost man to man, must we apply ourselves to them ; and only as active undertakings, our living business, our personal purposes and affairs, become associated with them, shall we do, either to them or to ourselves, the vast and varied good which it seems to be designed by Providence should issue from the connection.

If I have ventured into questions connected as much with the general welfare of India as with the production and commerce of cotton, it is because these questions are on all sides drawn into the discussion. At the same time I must confess that I have not unwillingly yielded to the inducement to enter on them ; for, if I am right, the path of practical improvement is to be sought in a direction towards which prevalent discussions do not often lead. And not only so, but our connection with India, even in its lowest view, has an elevated, solemn, almost sacred interest, which cannot be separated from it. While we are talking of a supply of cotton (as in the duty of honest industry and enterprise it is right for us to talk), and while we are counting up the probabilities of the loss or gain of a railway (as in the just prosecution of our daily business it is necessary for us to count them up), that Providence who serves Himself of us all, I doubt not, is using our natural and laudable activities as the means of imparting to the millions

of India the elevating and purifying influences which He has first intrusted to us. Our cotton is grown where, whether we mean it or no, we must carry our faith, and, more still, our example; and it cannot but be a matter of the deepest interest that that faith (the true source of all progress) should be recommended, not merely by its being the creed of the ruling caste, or by the greater decency of its external social usages, not merely by the practice of a simpler and purer ritual, or even by the possession of a truer theology, but by the prevalence of a spirit in the prosecution of every enterprise with which the Christians of Britain are connected, which shall truly exhibit its pure, just, and benignant character.

CHAPTER V.

THE GENERAL COMMERCE OF GREAT BRITAIN WITH INDIA.

IMPORTANT to our interests, beyond all doubt, as is the supply of cotton from India, it would be a mistake to suppose that a consideration of that subject affords an adequate view of the value which our eastern empire ought to bear in our commercial system. A hasty glance at that immense country, and its vast population, always produces a conviction that, for some reason, our commercial intercourse with it is far below its due magnitude; a belief which derives countenance from the increase which this commerce has experienced within the last twenty or thirty years. This general persuasion, however, seldom leads to more than a vague apprehension that some mysterious cause operates on a very strange people to obstruct the development of so natural an interest; and we attain to no definite idea of the magnitude of the object before us, of the means of securing it, or of the consequences which would follow success. The object of this chapter is to attempt to give some degree of precision and distinctness to these ideas, and to show, by analogy, the cause and remedy of the inadequate extent which is still a characteristic of our Indian commerce. It is true that neither the subject itself, nor the means available for its elucidation, are of a nature to admit of demonstration; but I believe that, in the absence of better materials of judgment, we may acquire, through a comparative argument, a degree of probability which shall safely guide our practical steps, although we might not be able by means of it to silence a logical opponent.

Of all the countries to which we trade, and of which we have sufficient authentic information, those parts of South America

and the West Indies which are not under British rule, afford, in the condition and wants of their population, the nearest parallel to India. It is necessary to separate from this comparison those parts of the above-mentioned countries which are under the government of England; for our exports to them, amounting, as also in the case of our colonies in colder latitudes, to nearly 3*l.* per head per annum, vastly exceed, in proportion to population, those to other countries, and seem to be influenced very much by the peculiarities of English habits. The argument which will be framed on the basis of a comparison of our exports to South America with those to India appears to deserve attention, for this reason amongst others, that it may serve to show, to some extent, what real force there is in the considerations of different kinds, and coming from different quarters, which have been adduced to account for the small amount of our commerce with our eastern possessions.

Mexico and the other countries of Spanish population north of the isthmus of Panama will also be noticed; not, however, without allowance for the prohibitory tariffs which, more in appearance than reality, have obstructed our commerce with them.

The climate of those parts of America to which I shall chiefly refer, does not so differ from that of India as to weaken the argument; it is not less tropical, or less likely to induce laxity of industry, or indifference to what we may deem superfluities or comforts. Except portions of Brazil, Chili, and some parts of the states of Rio de la Plata, on the south, and part of Mexico to the north, these countries lie within 20° north and south of the equator; they are known to contain some of the most enervating localities in the world. In climate the comparison can hardly be unfair.

Neither are the races of which the population is composed such as to account for any great difference in the demand for British manufactures; for while the descendants of the Spanish and Portuguese have become thoroughly acclimated, both in constitution and usages, the greater part of the population con-

sists of natives, mixed classes, and slaves; none of these, I presume, are more able or more disposed than the native of India, whether Mussulman, Hindoo, or aboriginal, to adopt the use of European goods. The disposition of the people of South America to take our manufactured goods can scarcely be more favourable than that described in the following account of the results of Messrs. Palmers' operations amongst the wild tribes on the banks of the Pranheeta, a branch of the Godavery in longitude 80° E. The Goands, who are the people here concerned, are lower in civilization than the Hindoos. Mr. Fenwick says¹:

"Our speculations in the country threw in a circulation of about one lac of rupees (10,000*l.*) yearly; the effects of this on the condition, appearance, and comfort of the Goands was remarkable within the first year, and continued to improve. Those who were seen with a piece of cloth scarcely covering nakedness, were hardly to be recognised with decent dhotees, good dooputtas, and pugrees. Some even carried this so far as to rival the gayest of the civilized who came there with us. The zemindars and others were glad to buy, where they could afford it, chintz and handkerchiefs, or a piece of red broad-cloth. Penknives, pocket-knives, and scissars became much in demand. The men led the way, but the women soon began to fancy a sarree and chowlee would not display their charms to less advantage."

From this instance it may be safely inferred that the readiness with which the natives of India, and even the lowest of them, fall into the use of manufactures, can hardly be exceeded in America; and the facts further show that *the use of our articles depends on our bringing into action the means of paying for them*, by affording employment to the waste energies of the country and people. It should also be noted that the natives of India in general are so much more advanced than the Goands here spoken of, that their appreciation of the com-

¹ Memorandum in possession of the Agri-Horticultural Society of Bombay, dated 19th July, 1831.

forts, and conveniences of life is much more easily awakened, and might clearly be made to operate much more effectually in the establishment and extension of commerce.

The state of the governments and of public security does not so differ as to afford any reason for our having been able to maintain a greater commerce with South America than with India. Ever since 1817 India has been as little disturbed as South America has since the expulsion of the Spaniards in a few years after that date. In the latter, changes of constitution, dividing of republics, and personal revolutions, have disordered the operations of industry, probably much more than anything which has taken place in India; and few South-American countries exhibit at present satisfactory signs of activity or progress. Better government, therefore, does not explain any difficulty the facts may be found to present.

Nor does it appear that lighter taxation favours our South American in comparison with our Indian commerce; for in the few instances for which information is available, the expenditure of the South-American Governments equals from 10*s.* 6*d.* to 16*s.* 9*d.* per head per annum, while that of the British Government in India does not reach to 5*s.* 9*d.*; and although we have not the means of comparing the taxation of each country with the value of its labour, as the argument requires, there can be little doubt that the personal burden is at least as great in South America as in India¹.

¹ The deduction in the table of 5*s.* 8½*d.* per head per annum as the taxation of India, is formed on the supposition that the taxation of the native states is equal per head per annum to that of the British. This is a point which might be approximately ascertained through the Residents or Commissioners in the several native territories; but I am not aware of any published means of learning what are the facts. If we take into account both the amount of taxes paid, and the deficiency of the service of protection rendered for it by many native governments; if we also remember that local and personal imposts and impositions considerably augment in most native states the amount of legitimate taxation; and then add to the whole the evils of the system of farming the revenues, it seems to me we shall doubt whether, in actual burden-
someness to the people, the taxation of the native states is generally lighter than that of the British territories. A well-ascertained tendency of the population to migrate into or out of our territories is, perhaps the only fact which could safely establish a

The tariffs of South America are not more liberal than that of India; generally speaking they are founded on a principal rate of duty, varying from 18 per cent. in Bolivia to 30 per cent. in Brazil, Venezuela, and New Granada. Formerly, and indeed during the period to which I shall afterwards chiefly refer, the import duties of Brazil were arranged on a general basis of 15 per cent., while Mexico held to a system of high duties and prohibitions. On the other hand the import duties in India on British goods have not been greater than from 3½ to 10 per cent. on British bottoms, and double those rates on others. Here, then, again is no difference comparatively adverse to our commerce with India.

Nor is our greater commerce with South America accounted for by any greater natural adaptedness of that country to produce acceptable articles for payment, as a comparison of our imports from the two quarters, as well as the known capabilities of India, and the history of its commerce, clearly prove.

The difference of distance and the accompanying difference of freight are not so great as to afford a solution of the difficulty. Even from Brazil to England (to say nothing of more remote parts of South America) the cost is not unfrequently as great as from India.

Finally, it is not religion or caste which occasions the difference. In the following tables it will be observed that while some of the principal articles of export are alike to all the countries specified, the variations in the other articles are not such as caste accounts for. • Indeed, it may easily be shown, that out of 1s. 2d. per head per annum, the value of the goods we have sold to the people of India, more than 11d. are of matters to which the regulations of caste notoriously do not apply at all; and of the rest, it is doubtful whether caste has at all interfered with the consumption, when the

general conclusion on the subject. Meanwhile the difference, if any, cannot be such as materially to affect the argument to be founded on the statement in the table.

goods could be obtained. Moreover, the actual amount to which our commerce with India has latterly attained is of itself a proof that we can supply to that country vast quantities of goods which find no prohibition in the prejudices or usages of the people.

With these remarks the object of the following tables will be understood; it is, to show the enormous disparity between our commerce with India and with a continent so nearly resembling it in all important respects as South America. The true and simple basis of the amount per head per annum is adopted in my further arguments, and, the needful reductions having been effected, the results are given in that form.

The table No. I., derived chiefly from the various reports and documents issued under the authority of the Board of Trade, gives in its first two pairs of columns the value of our total exports to each of the countries named, reduced also to the amount per head per annum of the population; and exhibits the average of the six years ending in 1845, a period, perhaps, on the whole less affected by disturbing influences than any other before or since. The second pair of columns, in the same table, gives the like for cotton goods only, which, as being our largest item of export, attracts especial attention. The columns of taxation in, and total export from, those countries, are occupied with materials derived chiefly from the same documents, but of varied authority, completeness, and sufficiency, and referring to different dates. Since my purpose requires only an approximative and comparative argument, and as no possible correction of these figures is likely to lead to a different practical conclusion, I do not abstain from availing myself of these imperfect materials, the best which can be obtained.

The population of the various countries mentioned is taken from the authorities relied on in the reports of the Board of Trade. In too many instances these statements are not sufficiently modern or well authenticated; but they are the best which are available for the purpose, and they are too probably

TABLE I.

Exports, General, and of Cotton Manufactures, from Great Britain, to the several Countries specified, on the Average of the Years from 1840 to 1845, both included, together with the Population, Taxation, and Exports of the same Countries at various Dates, as they could be ascertained.

	Population	Exports from Great Britain.			Taxation of each Country per Annum.		Exports of each Country per Annum.	
		General.		Cotton Goods.		Per Head per Annum.	Per Head per Annum.	Per Head per Annum.
		£	s. d.	£	s. d.			
INDIA AND CEYLON	114,500,000	6,265,340	1 1-338	3,883,716	8-405			
GROUP A.								
Mexico	7,015,509	485,727	1 4-6168	216,168	7-3951			
Central America (1847)	1,500,000	98,875	1 5-5764	68,552	10-9853			
Totals and Averages, A.	8,515,509	585,582	1 4-5039	284,720	8-1945			
GROUP B.								
Cuba and the Foreign West Indies	1,936,091	932,197	9 7-5559	412,765	4 3-1623			
Havti.....	700,000	175,292	5 0-1001	100,300	2 10-3886			
Columbia.....	2,797,168	540,566	3 10-3813	341,453	2 5-3004			
Peru	1,500,000	632,900	8 8-3200	329,853	4 4-7763			
Bolivia	750,000	50,000	1 4-1000	25,261	6-0835			
Brasil	4,450,249	2,331,031	10 5-7115	1,294,148	5 9-2535			
Totals and Averages, B.	12,133,516	4,681,966	7 8-6994	2,493,840	4 1-3280			
Do. B. excluding Ecuador and Bolivia	10,833,508	4,631,966	8 6-6146	2,468,579	4 6-6876			
GROUP C.								
Chili	1,300,000	924,606	14 9-0965	518,790	7 11-7653			
States of Rio de la Plata	1,197,000	775,076	12 11-4037	383,215	6 4-8351			
Totals and Averages, C.	2,497,000	1,699,682	13 7-3855	901,944	7 2-6907			
Totals and Averages, Groups B and C	14,630,516	6,381,638	8 8-6884	3,395,794	4 7-7046			
BRITISH WEST INDIES.....	886,209	2,487,823	2 15 11-7403	602,639	13 6-7079			

TABLE II.

Consumption per head per Annum of British Produce and Manufactures in the Countries specified, as appears from the Exports of Great Britain and Ireland thereto, in the year 1845.

	GROUP A.			GROUP B.						GROUP C.		
	India, with Ceylon.	Mexico.	(Central America (Values of 1847).	China and the Foreign West Indies.	Haiti.	Colombia, and Venezuela, viz., New Grenada, Guatemala, and Honduras.	Peru.	Bolivia.	Brazil.	Chili.	States of Rio de Ja Plata.	British West Indies.
Cotton Manufactures	3 8923 0	8 3761 0	10 9683 0	2 5935 3	3 1536 2	5 6911 5	5 7 1642		6 5 0928	9 3 1907 4	9 6339 0	3 14 0 3300
Linen do.	0 0 1283 0	0 0 1974 0	2 1012 0	3 2 8880 1	5 5063 0	8 1686 0	9 940 0		0 11 4672	0 9 1495 0	7 1681 0	0 3 10 4468
Silk do.	0 0 0281 0	0 0 2058 0	0 0 734 0	0 1 1818 0	0 0 0633 0	0 4443 0	2 257 3		0 7 562 0	0 1 6787 0	1 9467 0	0 0 5 4468
Woolen do.	0 0 0 43 0	0 2 5232 0	0 0 601 0	0 8 3405 0	6 2320 0	4 2153 3	3 9 4810		1 4 6378 0	4 3 9555 2	9 4075 0	0 1 3 0541
Apparel, Slops, and Haberdashery	0 0 2292 0	0 0 710 0	0 1806 0	0 1 2080 0	0 1975 0	0 1981 0	1 728 0		0 0 8648 0	0 1 5016 0	1 2684 0	0 5 10 1140
Iron and Steel Metal and Manufactures	0 0 3312 0	0 0 4381 0	0 3532 0	0 6 919 0	0 3175 0	0 4460 0	1 0211 0		0 3 6838 0	0 2 4895 0	3 0013 0	0 3 0 0000
Brass and Copper do.	0 0 0457 0	0 0 1265 0	0 0 478 0	0 2 5381 0	0 0 9837 0	0 0 5730 0	0 0 0 0 0		0 1 7963 0	0 1 1087 0	0 1 1892 0	0 0 8 1000
Hardware and Cutlery	0 0 5513 0	0 0 5426 0	0 0 5538 0	0 8 5414 0	1 2466 0	2 2297 0	5 7056 0		0 0 11923 0	0 6 1813 0	5 5000 0	0 1 8 1000
Machinery and Millwork	0 0 1925 0	0 0 2528 0	0 0 5040 0	0 0 8403 0	0 0 7880 0	0 0 3825 0	1 2288 0		0 0 4808 0	0 0 3343 0	0 0 216 0	0 1 0 4827
Coals, Culin, and Cinders	0 0 1104 0	0 0 263 0	0 0 0 0 0	1 2718 0	0 0 0063 0	0 0 3784 0	0 0 0 0 0		0 0 7406 0	0 1 2701 0	0 0 6077 0	0 1 4 4444
Glass	0 0 2179 0	0 0 0145 0	0 0 443 0	0 0 3833 0	0 0 1430 0	0 0 6539 0	0 0 1136 0		0 0 0866 0	0 0 0767 0	0 0 6410 0	0 0 11 3539
Earthenware	0 0 0650 0	0 0 0497 0	0 0 46 18 0	0 3 6591 0	2 0 173 0	0 0 8441 0	1 1786 0		0 2 2155 0	0 1 5304 0	1 1003 0	0 0 10 1507
Books, printed	0 0 0700 0	0 0 0067 0	0 0 0008 0	0 0 0392 0	0 0 0103 0	0 0 0215 0	0 0 0402 0		0 0 0311 0	0 0 0583 0	0 1584 0	0 0 3 0000
Stationery	0 0 1581 0	0 0 0431 0	0 0 0125 0	0 0 2297 0	0 0 0912 0	0 0 7773 0	0 0 4045 0		0 0 1758 0	0 0 06345 0	0 5482 0	0 0 1 0767
Arms and Ammunition	0 0 4879 0	0 0 0016 0	0 0 0016 0	0 0 6873 0	4 1953 0	0 0 1003 0	0 0 2026 0		0 0 15302 0	0 0 9763 0	0 0 0397 0	0 6 3 3171
All other sorts enumerated in the Offi- cial Lists	0 0 7690 0	0 0 1304 0	0 0 2056 0	4 2582 0	2 2733 0	0 0 3109 0	1 6472 0		0 7 9741 0	0 4 8433 0	3 4689 0	0 13 4 1193
All other sorts not enumerated in the Official Lists	0 0 5712 0	0 0 1890 0	0 0 2685 0	0 0 3639 0	0 0 1817 0	0 0 4127 0	1 2156 0		0 3 2597 0	0 3 1841 0	2 4762 0	0 7 5 587
Totals	1 2 0516 1	6 7173 1	3 9765 1	12 10 9290 6	1 7390 3	11 8893 11	5 8933 0		11 2 4642 0	16 6 9443 9	10 7524 0	2 17 3 6800

The "Notes and Authorities" are placed at the end of the Chapter.

Included in "Peru," see "Notes and Authorities," and pages 180 and 182.

near the truth to leave any doubt on the general result of the argument, although, without question, individual statements amongst them are open to dispute.

In order to afford a view of the proportion in which the principal articles of commerce enter into our transactions with the different countries to be referred to, the table No. II. gives our export to them in the single year 1845, derived from the report of the Board of Trade, and reduced for the population, so as to show, in price, the consumption per head per annum of each class of articles. Various inferences, too obvious to need notice here, will be derived from this table on mere inspection.

The first point which challenges remark is, that while our commerce with India and Ceylon amounts to but 1*s.* 1*d.* per head per annum of the people of those countries, that which we maintain with that section of South America and the West Indies (group B) which may be most fairly compared with it reaches to 7*s.* 8½*d.*, and in one country, Brazil, to 10*s.* 5½*d.* per head per annum. If to these countries we add the next group, the average rises to 8*s.* 8½*d.* per head per annum; Chili takes from us not less than 14*s.* 2½*d.*, of which, indeed, part may be re-exported, and so only find its true place in the general average. On the other hand, Mexico and Central America approach to India in the meagreness of their transactions with us. It is further to be noted, that great variations exist in the amounts taken from us by such of the countries mentioned, as on the whole may be most properly grouped together for the purposes of investigation.

This table, then, exhibits the important fact, that although our exports to India nearly equal in absolute and gross amount those to South America, yet they are not more than one-seventh or one-eighth per head of the population of the two countries respectively; a conclusion too marked to be affected by any possible correction of the data, and of too great practical importance to be permitted to rest without discussion. An examination of the facts which produce the variations of

our commerce with the different parts of South America itself, will go far towards showing the cause which, in its still more inveterate operation, keeps down our commerce with India.

In South America the roads are nearly on a level, in quantity and quality, with those of India; while the use of some of the chief navigable rivers has been much obstructed, in the far interior, by international jealousies or the hostility of native tribes. Under these circumstances, the local distribution of the population explains, to a great extent, the inequalities in the demand for our manufactured goods. Where, from the proximity of the sea or other local causes, the cost of transport to the seats of population is comparatively small, the demand is greatest; where the population is situated far from the sea, or can be reached only by difficult roads and costly carriage, the demand becomes small, and, in truth, almost vanishes. This general rule is modified to some extent by other circumstances; but it seems to afford the main clue to the right understanding of the case.

In estimating the effect of want of roads on our exports, it must be remembered that the disadvantage commonly applies not so much to the cost of conveying our manufactures inwards, as to that of bringing to the coast the heavy agricultural and other produce which is to pay for them; and we shall see a few instances, both in America and India, where the effect is mitigated by the substitution of a lighter material of commerce. Notwithstanding, however, the occurrence of a few such instances, it must still be true, in general, that no country little advanced in the mechanical arts can pay for manufactures in other than crude and heavy produce; and such a country can make little progress besides that which is permitted by the means it may possess of cheaply transporting that produce to more advanced countries and more thickly-peopled seats of consumption. This, which is true of all countries, is especially so of India: the subject matters of its export commerce, if that commerce is to be much extended, must necessarily, for a long time to come, be of a coarse and

ponderous character; and by so much does its need of roads, and the effects of its want of them, afford a just parallel with the case of South America; the apparent exceptions also to the operation of the principle in both cases confirm its general truth.

Our examination of the circumstances affecting our commerce with the different parts of America begins with that of Mexico. In this country a tariff highly inimical to foreign commerce, and great insecurity to life and property, aggravate, but do not conceal, the consequences of want of roads. In 1841, Mr. Mayer, an American gentleman, thus described the road from Vera Cruz to the capital¹:—"I found the Governor and other officers exceedingly anxious to afford us all the protection in their power on the road to Mexico. They say that the country has lately been scourged by troops of dragoons, but that it is still infested with robbers; and although we are to have a military escort, our friends appear to intimate that Colt's revolving pistols, double-barrelled guns, and a stock of resolution and coolness, will be our best safeguards. We have, therefore, taken the stage which will depart four days hence," &c. * * * "Our road, as soon as it left the river, ascended rapidly, and passed over a track which would in any other country be called the bed of a mountain stream, so rough and jagged was its surface. Although it is the duty of the Government to keep this highway in order, yet, as the chief travelling is on horseback, and the principal part of the merchandise is transported on mules, no one cares how these animals get along. Sure footed and slow, they toil patiently among the rents and rocks, and their drivers are too well used to the inconveniences to complain. Besides this, in case of insurrection, it is better for the roads to be in bad condition, as it prevents easy communication between the several parts of

¹ For quotations of this character I am content to go to the authentic and well-selected statements in the volumes entitled "Commercial Tariffs," &c., compiled by Mr. Macgregor, under the directions of the Board of Trade; and this general reference for the chapter will be sufficient, except where I give other authority.

Mexico, and the disjointed stones serve to form, as they have often done, breastworks for the insurgents. But over this mass of ruin we were obliged to jolt in the ascent of the mountain during the whole afternoon, meeting in the course of it, with *fifty waggons with heavy machinery for factories near Mexico.*" * * * "Our descent commenced from the eminence where we had halted awhile to survey the valley. Our coachman was an honest Yankee, fearless as the wild horses he drove; and they scoured along under his lash as if we had the level roads of New England beneath us. But alas! we had not. I question whether there are any such roads elsewhere in the world; nor can you conceive them, because your experience amongst the wilds of the Aroostook, or the marshes of the Mississippi, can furnish no *symptoms* of such highways. They were gulleys, washed into the mountain side by the rains; filled, here and there, with stones and branches; dammed up to turn the waters by mounds a couple of feet high; and thus gradually serpentineing to the foot of the declivity."

Such even as is this road, only one other beside it, practicable in any degree for wheel carriages, is to be found up the eastern boundary slope of the central table land, on which much the greater part of the population of Mexico is situated; and these two roads are nearly 500 miles asunder¹.

M. Chevalier² says, "The splendid road which during the domination of the Spaniards was constructed across deserts and precipices, by the merchants of Vera Cruz, to the summit of the upper country" (which is the road already referred to) "is a melancholy instance of the carelessness with which the public interests of the country are directed. During the war of independence, this road was cut up at various points; and down to this day the enfranchised Mexicans have not replaced a single stone, nor filled a single trench, nor even cut down one of the trees, which, in the absence of any considerable traffic, and under the influence of a tropical sun, are growing up to a mag-

¹ Penny Cyclopædia, art. Mexico, page 151.

² M'Culloch's Commercial Dictionary, art. Vera Cruz.

nificant size in the very middle of the road. In the upper country nothing would be more easy than to open noble means of communication. The soil is naturally level; and basaltic rocks, particularly adapted for the construction of roads, are found in great abundance. But even where there are roads, the Mexicans make little use of them. They carry to a yet more extravagant length the inconceivable predilection of the Spanish race in favour of transporting their goods on the backs of animals. You expect to meet with carts and waggons; no such thing; everything is conveyed on the backs of mules or Indians. Troops of little consumptive donkeys bring into the city, in parcels not much bigger than a man's two fists, the charcoal required for the culinary operations of the inhabitants. The price of every bulky article is thus increased to an enormous degree. The interior districts are as inaccessible as if they were cut off by an enemy's army, and famine frequently ensues."

In a country where this is the condition of the means of transport, the inhabitants are located chiefly in the interior,—they occupy table lands varying from 3000 to 8000 feet above the level of the sea,—they are spread over a country intersected continually with mountain ranges,—and their principal cities are 1000 miles asunder.

" Travelling from Vera Cruz to Mexico, you are scarcely ever out of sight of caravans of arrieros (muleteers) going and returning. It is the mode of transportation to which they have been accustomed, and nothing can induce them to change it. A Frenchman, some few years since, established a line of waggons on the route, and died whilst I was in Mexico, leaving a fortune of some 400,000 dollars—all of which he had made from a very small beginning,—yet no one was disposed to continue the business. They are satisfied with what they have been accustomed to in all things; and perhaps, in this particular instance, they have reason to be, for these muleteers make a great deal of money. The load for each mule or jackass is 400 lbs., for the freight of which from Vera Cruz to Mexico they receive 5 dollars the 100 lbs."—*Thomson's Recollections of Mexico*, page 36. Taking the Mexican dollar at 43d., and the travelling distance from Vera Cruz to Mexico at 220 miles (the geographical distance being 200 miles), this is equal to the extraordinary rate of 21·89d. per ton per mile, fifteen or twenty times the cost of carriage of coarse goods in England, five times the average rate of Bombay, and equal to the cost of carriage in nearly the worst districts in India in the worst of times.

Under these circumstances it scarcely needed a prohibitory tariff to cut off external commerce. Internal wants are supplied by internal manufactures. Everywhere cotton is manufactured; rudely and dearly, it is true, but still at a cost less than that of maintaining, with such roads, the commerce in heavy produce through which alone local manufactures could be superseded. "At Salamanca, another manufacturing town, where the machinery was moved by animal power, cotton cloth, which cost $37\frac{1}{2}$ cents to produce, could be made in the United States at $12\frac{1}{2}$ cents;" and no doubt in England for much less.

The export commerce of Mexico amounts to 10*s.* $2\frac{1}{2}$ *d.* per head per annum, of which 9*s.* $5\frac{1}{2}$ *d.* is supplied by silver. To its production of the precious metals is Mexico, like some other American states, indebted for the power, with such means of transit, of making any export whatever.

Sufficient indication, I apprehend, is afforded by these facts of the causes of the limited extent of our commerce with Mexico: it amounts to but 1*s.* $4\frac{1}{2}$ *d.* per head per annum¹, of which one-half consists of manufactures of cotton. The circumstances of the case, as exhibited in the preceding extracts, furnish a striking similarity to those of India, and almost render unnecessary the question why India, without a prohibitory tariff, should take from us, man for man, not so much as Mexico.

Of Central America too little can be affirmed with certainty, as to the period from 1840. to 1845 inclusive, to warrant more than general, although very strong, conclusions. Up to the last-mentioned year our commerce with that country was on the most trifling scale; but in 1847 it had reached the amount

¹ If any material doubt can attach to this result, it must arise from the fact that the prohibitory tariff of Mexico, like that of every other country, gives rise to an enormous amount of smuggling. If, therefore, the figures from which this conclusion is derived had been those of the Mexican custom-houses, they would certainly have been far below the truth: but as they are those of the British accounts, probably no such error, to any serious extent, affects them.

given in the table, of 86,983*l.* direct export from England, and 12,872*l.* of re-export of British manufactures from the West Indies; and it may well be hoped that the stream of enterprise, which has now begun to pass through this finely-situated territory, will speedily bring its great natural capabilities into action.

Confining, then, the following remarks to the period above mentioned, the first consideration is, that its political turmoils kept its industrial efficiency lower than that even of any other Spanish-American state. Mr. Stephens, "after ceasing to look for a government, as a hopeless search in the divided anarchical country to which he was sent as a minister from the United States, packed up his diplomatic uniform, and some other articles, and forwarded them to his own republic," continuing his travels as a mere observer of the country in a private capacity.

Although the effects of a want of the means of communication are here blended with those of a want of efficient government, it is not difficult to trace their operation. "The route from the Golfo Dolce, on the east, to the city of Guatemala, near the western shores of America, has been passed over for more than 200 years; yet no road, properly speaking, has been constructed for carriages; and goods, provisions, and not unfrequently travellers, continue to be carried on men's shoulders, or on the backs of animals." After describing the earlier part of the road, in which mud-holes, roots of trees, the ruggedness of a mountain torrent's bed, and the perplexities of a forest, gave the characteristics, and affording a glimpse of the confusion, hindrance, and damage which such tracks produce, Mr. Stephens thus proceeds to describe another part of the route:—"The ascent began precipitously, and by an extraordinary passage. It was a narrow gulley, worn by the tracks of mules and the washing of mountain torrents, so deep that the sides were higher than our heads, and so narrow that we could barely pass without touching them. Our whole caravan moved singly through these muddy defiles, the muleteers scattered among them and

on the bank above, extricating the mules as they stuck fast, and raising them as they fell, arranging their cargoes, cursing, shouting, and lashing them on. If one stopped all behind were blocked up, unable to turn. Any sudden start pressed us against the sides of the gulley, and there was no small danger of getting a leg crushed. Emerging from this defile, we came again among deep mud-holes and projecting roots of trees, with the additional difficulty of a steep ascent. The trees, too, were larger, and their roots higher and extending further; and, above all, the mahogany tree threw out its giant roots, high at the trunk and tapering, not round, like the roots of other trees, but straight, with sharp edges, traversing rocks and the roots of other trees." * * * "The descent was as bad as the ascent." "In one of the muddiest defiles we were shut up by the falling of a mule before, and the crowding of us all behind; and at the first convenient place we stopped until the whole caravan had passed. This is the great high road to the city of Guatemala, which has always been a place of distinction in Spanish America. Almost all the travellers and merchandise from Europe pass over it." * * * * "With ten hours of the hardest riding I ever went through, we had only made twelve miles."¹

Here, as in Mexico, with these wretched means of transport, the greater part of the population live on the table lands, at a great distance from the sea, whose elevation is rarely less, and often more, than 5000 feet. The consequence is, that the commerce of the country is most insignificant, while coarse local manufactures supply local wants, although better goods could be had for much lower prices from Europe.

Of such a country, divided under several hostile chiefs, and of whose commerce no detailed information is given, the foregoing is perhaps all that can safely be said; but there is enough to show the operation of the principle I have pointed out. The measure of that operation is, however, hardly to be inferred from the figures in the table, through want of anything

¹ A toll has since been imposed for the improvement of the road.

beyond mere guesses as to the amount of the population, probably the rate of our export to this country, which is there given, viz. 1*s.* 5½*d.* per head per annum, is something too high.

If it be alleged that misgovernment and insecurity have contributed, with want of roads, to lower the industrial power of these countries to an extreme point of depression, so like that of India, the obvious reflection is, either India is equally misgoverned, or it suffers still more than Mexico and Central America from want of roads. The former alternative is, I believe, not true of British India, nor of some of the native states: the latter much more exactly and truly represents the real facts of the case.

A complete contrast to these results is afforded by the commerce of the foreign West Indies; and even Hayti, with all its revolutions, shines in the comparison. Our exports to the latter island amount to 5*s.* per head per annum, of which 2*s.* 10½*d.* consists of cotton goods. Here, notwithstanding former desolations, and even the civil wars which raged during part of the very period under review, we sell nearly four times as many goods, in proportion to population, as in Mexico, and almost five times as much as in India. As between Hayti and Mexico, it is in vain to allege difference of race or climate, or lighter taxation; neither is one country a whit safer or more tranquil than the other, nor does it present in any respect better evidences of improvement. It is said that "from the day on which Christophe expired to the present day, a period of twenty-six years, neither industry nor improvement, nor energetic administration, nor the extension of the education of the people, nor any progress in the march of civilization, appears in the agricultural, manufacturing, commercial, moral, social, or political condition of the republic of Hayti. The climate, the soil, the pastures, yield, almost without culture, sufficient merely to feed a people too indolent to work for comforts and luxuries."

Yet this degraded and distracted people, who inhabit a country in which the support of merely animal existence is

compatible with the utmost indulgence, have commonly maintained with us a commerce in which our exports have been five times those to India. These facts are the more important since whatever has been said or imagined against the natives of India—their land, their manners, or their government—seems to be still more strongly applicable to Hayti. The cause of the difference appears clearly to be that, while India is a vast continental country, with no roads and few rivers, Hayti has no point more than 60 or 70 miles from the sea; hence to other difficulties is not added the great and constant one which afflicts India, Mexico, and Central America, viz. vast cost of carriage; and hence, I apprehend, not only the amount of our business with Hayti, but also the power of that country to export to the amount of 17s. 5d. per head per annum entirely of agricultural products.

A remark is suggested by the variations in the amount of our trade with this island, occasioned by its civil war, which ended in the expulsion of President Boyer. In 1840 our exports to it were at the rate of 7s. 2d. per head per annum; in 1843, the year following the political convulsion, they fell to 2s. 10d.; but in 1845 they rose again to 6s. 2d.; a rapidity of recovery which could hardly have taken place had the country been of the extent of India or Mexico, and with no better roads than theirs.

Cuba and the foreign West Indies stand much higher in the scale than Hayti, and of course vastly above Mexico and India. Here our exports reach 9s. 7½d. per head per annum; cotton goods contributing 4s. 3d. to that amount. Without staying to remark on the commerce of the other islands, for which sufficient information in detail is not available, it will be instructive to note some peculiarities of that of Cuba. This island is a better customer to us than the foreign West Indies in general; our export to it being 10s. 11d. per head per annum. Here in particular it cannot be said that light taxation occasions the prosperity of the country, and the extent of our commerce with it; for that taxation amounts to the surprising sum of

2*l.* 10*s.* 10*d.* per head per annum; out of which it not only maintains large and costly establishments, and pays the diplomatic services of Spain in North and South America, but remits to Spain, annually, near 1,250,000*l.* sterling, or 1*l.* 1*s.* 3*d.* per head per annum; and further, it is well known that its governorship is given by the Court of Madrid, expressly that the occupant may improve his fortunes by it; and the post is said to yield its possessor a clear 100,000*l.* per annum of savings. In other words, Cuba supports a taxation amounting to double its own expenditure, and nine times per head that of India, and, besides this, affords to its principal functionary perquisites which amount to 2*s.* per head, this one surreptitious item alone being one-third of the whole taxation paid by each native of our Indian possessions.

The exports of Cuba are singularly great, being 5*l.* 5*s.* 11*d.* per head per annum, or forty-six times those of India; and, moreover, with the exception of some copper ore, and a small quantity of European manufactures re-exported, they consist of agricultural produce; and, what is still more remarkable, the imports include no inconsiderable amount of "provisions," "breadstuffs," and "lumber,"—articles which evidently could not be exchanged for other agricultural products without cheap and convenient carriage, or, as more probably happens in Cuba, short distances of such carriage as they have. Here facility of communication evidently permits the people to devote their own energies, and those of their land, to the most suitable and profitable pursuits, while they purchase articles which, in a country less favourably situated, would be disadvantageously grown at home. This case, which exhibits, through facility of transit, the advantages of exchanging even different varieties of agricultural products (the trade being able to bear twice over so light a charge for carriage), is in exact and striking contrast to those of the countries in the Andes and in the interior of India, where agricultural produce must be converted, on the spot, into lighter objects of commerce, before the means of carriage will permit external traffic to be carried on in any degree.

It is hardly possible not to recognise here the well-marked consequences of an insular situation, through which no cost of carriage to the interior can be great; but even this state of things has latterly been much improved, and Cuba now presents one of the most remarkable and beneficial fields of railway enterprise. In a country of slaves, under the absolute and corrupt dominion of Spain, the creations of modern science have an application and value which they have not yet acquired in India.

*But even further; while the commerce of Cuba was restricted to its dealings with Spain it languished; the people were few, poor, and dispirited, and the island was a burden to the mother country. In 1818 it was finally freed from these restraints; its trade then began to flourish, and it has now attained the magnitude already stated¹. Now a government obstruction to commerce is just the same thing as a physical obstruction; a corn-law, a restriction in the direction of trade, a heavy import duty, and a bad road, are very nearly the same things in their effects on trade, that is, they enhance the cost to the consumer, and so limit both enjoyment and demand. It is a mere inconsistency, then, to seek to abolish obstructive *laws* and neglect to abolish obstructive *roads*; or to promote railroads, steam navigation, and improvements in sailing vessels, while we defend laws which put by authority of Government those very difficulties in the way of exchange, which we rightly seek to abolish when imposed by authority of nature.*

Viewed in this light, the improvement—we may say the creation—of the commerce of Cuba, which took place as soon as the difficulties of intercourse were removed, affords a most emphatic lesson in respect of India. The Government of India has wisely abandoned the principles of commercial legislation which so long deluded the world, but the equivalent evil of bad means of transit remains. India without restrictive commercial laws, but with no roads or extremely few and bad ones, is what Cuba was without those laws, but with little cost of carriage.

¹ Madden's Cuba, page 53, &c.

It may be confidently expected that the amendment of the means of transit in India will be followed by the same results as the abolition of the restrictive laws in Cuba.

Columbia, now divided into the three republics of New Grenada, Venezuela, and Ecuador, next requires attention. Up to 1845 our commerce with these countries was reported in a single item, under their former single name: our direct export amounted to 2*s.* 1½*d.* per head per annum, to which is to be added the re-export of British manufactures from the West Indies, making a total of 3*s.* 10½*d.* per head per annum, cotton goods standing for 2*s.* 5½*d.*;—a result intermediate between those of Mexico and the foreign West Indies, the consequence of intermediate circumstances.

It is necessary, however, to take these countries separately. Some part of the population of New Grenada is situated not unfavourably for communication with the sea; it occupies the Isthmus of Panama, with the valleys of the Magdalena, the Cauca, and the Atrato Rivers. The parts of the inhabited country which are not well placed for transit are the elevated range on which Bogota stands (from which, and from its eastern declivity the sea is best reached at Maracaybo), the low wooded lands on the Caribbean Sea, the wild coast of the Pacific, the elevated southern extremities of the river valleys, and the great swampy plains east of the Andes; the latter appear to be the least occupied parts of the country. Rivers which may be navigated with greater or less convenience traverse or approach the best-peopled districts; and the facility of transit by the chief river, the Magdalena, may be judged of by the fact that at Honda, 450 miles from the coast, that stream is but 678 feet above the level of the sea. Nor can the Atrato be very unfavourable to navigation, since it admits boats to descend it from Quibdo, 200 miles from its mouth, which are still capable of performing a coasting voyage of 200 miles more to Carthagena.

Notwithstanding, however, these natural advantages, the distance of some of the chief seats of population and production

from those of maritime commerce, and the absence of sufficient effort to remove impediments to transit, keep down the total exports of the country to 7*s.* 8½*d.* per head per annum, of which amount 4*s.* 7½*d.* is contributed by precious metals, with some pearls and emeralds. The taxation of this state in 1843 was nearly double its exports, being 15*s.* per head per annum; but it appears to have been considerably reduced since that period.

In Venezuela one-half of the population is located in the metropolitan and maritime province of Caraccas, and the greater part of the remainder on other parts of the coast, or in districts with not very difficult access to it. Navigable rivers are not rare. The vast expanse south of the Orinoco is little inhabited. The advantage of proximity to the sea, or navigated streams, is, however, diminished by the mountainous character of some parts of the inhabited territory; yet as the distances are nowhere great, the disadvantageous effect is not to be compared with that in Mexico or Central America. The exports of Venezuela amounted in 1843-46 (after having been much greater) to 1*l.* 0*s.* 2*d.* per head per annum, of which four-fifths were heavy agricultural produce, and only one-ninth was specie.

Ecuador, the remaining division of the country formerly called Columbia, affords in its commercial affairs a remarkable contrast to Venezuela. The Andes, split from north to south in New Grenada by the valleys whose rivers facilitate internal communication, become, in the territory of Ecuador, a consolidated and very elevated mass. The great plains east of this mass are tenanted by little else than thinly scattered hunting tribes; nor, on the west, does the country on the sea-coast contain any considerable part of the whole people. The mountain valleys of the Andes, elevated from 7000 to 10,000 feet above the sea, are the chief seats of population; if any other are to be noticed they are the valleys of the Guayaquil and Dauli Rivers in the immediate neighbourhood of the port which bears the name of the first-mentioned. Formerly European goods reached the eyrie-seated inhabitants of the mountains

by way of the rivers of New Grenada, from whose highest navigation they pursued a route which, traversing range after range, attained at points the heights of 8000, 10,000, and 15,000 feet above the sea; a route involving such severity of effort and of climate as to occasion annually the loss of many lives. Of late years, however, the external commerce of the country has been almost entirely conducted through its only port of Guayaquil, which communicates with the mountain locations of the greater part of the nation by few roads, and those such as, from the configuration of the country, have extremely steep ascents, and require excessive labour for transit. The total exports of this port do not much exceed 200,000*l.* per annum, or 8*s.* per head, and of this more than one-half consists of cocoa grown in the low valleys near the coast. Even the silver mines are but little worked, and the only other product of importance transmitted from the interior, is cinchona bark; an article whose uses permit it to bear any price at which it can be procured, and of which our chief supply comes not from Ecuador, but from Peru and Chili.

In this state of things we are not surprised to meet with important local manufactures, and it is remarkable that these manufactures are situated in the elevated country which, from difficulty of carriage, cannot export its products, while European goods supply the coast where cocoa, the greatest article of export, is grown. The following extract, selected merely for its brevity, exhibits the condition of the commerce of this country. "The manufactures of Ecuador are described as more important than those of any other of the South-American republics. Coarse woollen and cotton stuffs are woven at many places in the elevated valleys. The inhabitants of the coasts prefer English goods. There are manufactures also of silk, and some tanneries. But all these fabrics are produced at a much higher cost there, and are generally inferior to imported manufactures."

I have said that up to 1845 our commerce with these countries was reported under the single head of Columbia; if

we take the report of the following year, 1846, in which the export to each country is given separately, we shall find the foregoing views confirmed. In that year our exports, including the re-exports of British manufactures from the West Indies were as follows:—

	<i>s.</i>	<i>d.</i>
To New Grenada	5	5
To Venezuela	5	6½
To Ecuador	0	3½

In truth, the last-mentioned country, pre-eminent in difficulty of transit, takes almost nothing from us, except in small quantities for the supply of its coast population, through the intermediate agency of other South-American ports.

Justice to the argument is now seen to require that the statement in the table be corrected, by considering our exports to Columbia as consumed only by the people of New Grenada and Venezuela. This view would give for the six selected years an average of 4*s.* 9¾*d.* of total exports, and 3*s.* 10½*d.* for those of cotton, instead of 3*s.* 10½*d.* and 2*s.* 5½*d.* for each respectively.

Here then again we have an instructive comparison, not only amongst the constituent states of Columbia, but of New Grenada and Venezuela, with India and Mexico, on the one hand, and the foreign West Indies on the other; the intermediate circumstances of the first mentioned clearly leading to an intermediate amount of commerce.

Peru and Bolivia afford a close parallel to the case last examined: our commerce with them was reported in one sum up to 1845, nor do any published accounts afford a certain means of separating them. The proportion of imported commodities which proceed inland to Bolivia can, however, be but small; since, while the exports only from England to Peru have averaged 700,000*l.* per annum, the imports of ultramarine goods of all countries into Bolivia, by its land frontiers, have not reached to more than from 30,000*l.* to 60,000*l.* Our

direct exports to Bolivia in the years 1846 and 1847 were 7455*l.* and 22,375*l.* respectively.

Bolivia lies on the inland side of Peru, with, however, access to the Pacific, by a short coast frontier containing one port, Cobija (or Lamar), the littoral district being not much better than a desert. Part of the goods for use in Bolivia enter the continent by this port, and part by that of Arica, in the adjoining territory of Peru. Some portion at least of the duties is collected at the inland custom-houses. The population of Peru is estimated, with some probability, at 1,500,000; that of Bolivia is merely guessed, and the guesses vary from 500,000 to 1,500,000, the lower being probably the nearer the truth; I therefore take 750,000 as the best conjecture the case permits.

In the midst of this complexity of circumstances, and with corresponding obscurity of evidence, it is difficult to assign numerical values to the facts, which shall not be open to considerable doubt; but the general character of the case is clear beyond question. For the sake of doing no favour to the argument, I propose to take 50,000*l.* as that portion of the goods we have exported both direct and through Peru, for consumption in Bolivia; and the table is arranged accordingly, both in the column of total export and proportionably in that of cotton goods. This conjectural arrangement gives 8*s.* 8½*d.* per head per annum as our total export to Peru, and 4*s.* 2¾*d.* as that of cotton goods; while to Bolivia, this supposition, by no means, I apprehend, adverse to our trade with that country, exhibits only 1*s.* 4*d.* per head per annum, or the amount of our total export to Bolivia, of which 8*d.* consists of manufactures of cotton. Of the total exports of Peru four-fifths are in silver.

The population of Peru is chiefly situated in the mountainous interior; the greater part of the country between the Andes and the ocean being unfit for the support of a numerous people, and affording not much for export. The elevation of the chief seats of population is from 7000 to 14,000 feet above

*the sea ; and the roads to them from the coast, which are of the most difficult description, traverse very elevated passes in the mountains, the lowest reaching to 10,950, and the highest to 15,600 feet above the sea level*¹. These roads, on which the llama, with a load of 70 or 80 lbs., travels at the rate of 10 or 15 miles a day, are thus described :—

“ There are places where there would be danger, on meeting an impatient animal or careless horseman, that either party would be hurled over the brink, and consigned to the condors and eaglets that nestle on the cliffs, and in the dark chasms of the crags.

“ Such dangerous passes are at some places so contracted that the stirrup of the muleteer is seen to overhang the foaming stream, or project beyond the verge of the boldest precipice ; and every now and then they are made more formidable by abrupt angles and insecure breast-work without parapets, hastily constructed when the rush of a sudden torrent from the hollow of a hill, or large stones rolling from the heights, have cleft the way, so as to render it for a time impassable.

“ There are many *cuestas* or rapid steepes, with here and there flights of steps roughly cut in the hard rock. By the wayside, in tedious *cuestas* of several leagues in extent, recesses are in numerous instances worked out on the higher side of the road, which serve for the passengers to draw up, while those from an opposite direction are allowed to pass on, or where muleteers stop their cattle, to adjust their cargoes and tighten their lassos. But when a rock, or shoulder of a cliff, juts out from the road towards the lower or precipice side, leaving more or less of room for a resting-place, then the little flat place is coarsely walled in with large fragments of rock, and such smaller stones as may be at hand, giving the idea of a rude but commanding fortress.”

In such a country it is evident that none but goods extremely light, in proportion to value, can be exported. Hence the immense preponderance of silver in the export trade ; and

¹ Penny Cyclopædia, art. Peru.

hence, also, the fact that Peru is indebted to its silver mines for its capability, *with such roads*, of keeping up an export at all. It is necessary that the agricultural produce of the interior be commuted into value of the form of silver, to make it available for procuring the advantages which, in every country, are dependent on foreign intercourse. The following extract will clearly show the operation of this principle; a principle highly important in its application to the facts of Indian commerce¹.

“Respecting Huanaco, although the principal city or capital of the department to which it belongs, we have to observe, that the consumption of its agricultural produce, as well as its own internal prosperity, depends on the mineral seat of Cerro Pasco. When the population of Cerro rises to 10,000 or 12,000, every article of Huanaco produce is in high demand; but when, from any cause, the mines are not wrought, or when these are inundated from defective drainage, and the hands employed in working them are fewer in number, the Huanacuenos and other neighbouring agriculturists are greatly discouraged, or actually ruined; *because deprived of this outlet for their produce, they cannot undertake the expense of sending sugar and spirits on mules to the coast*. The consequence is, that they are frequently poor in the midst of plenty, the owners of extensive herds of sheep on the high pasture lands, whose wool is of little value to them, as it cannot pay for mule and llama carriage to the coast; and the scanty produce of the looms of the interior have little estimation, as the ruined ‘obrages’ or manufactories now amply testify. The shuttle is, moreover, nearly put at rest by the cheaper articles of warm woollen as well as cotton clothing, continually introduced from the stores of our English manufacturers.”

¹ Huanaco is on the eastern declivity of the Andes, in 10° south latitude, only 180 miles in direct distance from the coast, and with an elevation of about 7000 feet above the sea; Cerro Pasco, to the south of Huanaco, with its rich silver mines, and a population varying from 10,000 or 12,000 to 16,000 souls, is 7000 feet higher still, an ascent which is accomplished in the short distance of fifty miles. Between these districts and the ocean lie the roads and mountains just described.

Almost every word of this description is strikingly true of *the interior of India*: the views it sustains will be hereafter disscussed, and they might well be taken as sufficient to account for the backwardness of India, and for the difficulty of managing her interests. Meanwhile, this fact is to be remarked,—that the population of Peru, being chiefly seated in the interior, and the means of transport from the coast to the seats of population being extremely bad and ~~expensive~~, the power of export possessed by the country, and consequently its power of purchasing our manufactures, depends on the opportunity it happens to possess of transmuting the value of its agricultural produce into value in the form of silver;—that when this cannot be effected no export, or at least no sufficient export, takes place;—and that when it can be effected, there is no other obstacle to the preference and use of our manufactures;—a very remarkable proof that the consumption of our manufactures, and the amount of our exports, depend chiefly on the state or the means of transit in other countries, relatively to the character of the native produce to be brought to the ocean side.

Before leaving Peru it may be remarked that saltpetre, the only coarse and heavy article exported in considerable quantities, is found in a district near the coast.

Bolivia presents, in an exaggerated degree, all the features of the case last discussed. Its scanty piece of coast is a desert which produces nothing for export, and adds to the difficulties of transit. The most populous districts are upon and beyond the Andes, at from 250 to 500 miles from the coast. The only roads are extremely circuitous, and pass in every case over very elevated chains of mountains. The height of the seats of population above the sea is not less than in the case of Peru, while the length and difficulty of the routes of transit are still greater.

“The difficulties encountered in travelling from the port of Cobija to Oruro are so great, that though the Bolivians have declared Cobija a free port, they hardly use it, and prefer importing the small quantities of foreign commodities for which

there is a demand through Arica and Tacna. The road connecting Tacna with La Paz traverses one of the two passes called Las Gualillias, of which the northern rises to 14,200 and the southern to 14,830 feet, and, though foreign commodities passing through any part of Peru have to pay a transit duty of three per cent., this road is preferred for the transit of merchandise."¹

The result of this state of things is, that our exports to Bolivia, as reported, are on the smallest scale, the greatest amount of the direct export from England having been apparently but 22,375*l.*, or 7*d.* per head per annum; and if we add to this all the re-export of British goods from other countries, the largest probability will admit, the sum does not rise beyond 1*l.* 4*d.* per head per annum. The exports were in 1843 not more than 6*s.* 9½*d.* per head, of which 8*s.* 4½*d.* was in silver.

Here facts like the following would be expected. In the valley of Titicaca, near Oruro, and west of Potosi, "copper is found in abundance on the surface; the ore is described as very rich, but it is not brought to the Pacific, as it will not pay the expense of carriage." * * * "The natural fertility of the department" (of Santa Cruz de la Sierra, on the east of the Andes) "is remarkable; nothing, however, is produced for exportation." * * * "The great difficulty and expense of carrying commodities to the populous districts of Bolivia, separated from the Pacific, had compelled the inhabitants to become their own manufacturers. Cottons and woollens are manufactured; tanneries are also numerous. There are some glass works and manufactories of hats, cloth," &c. * * * "Few foreign commodities are imported into Bolivia. They are chiefly iron and hardware, with a few articles of finery, as silk, &c. The exports are nearly altogether limited to the precious metals, and to different kinds of woollens, made of the wool of the llamas and alpacas, and to hats made of the wool of the vicunas. The agricultural products of the country will never be exported till commerce has made its way up the Amazon and Madeira Rivers." * * *

¹ Penny Cyclopædia, art. Bolivia.

Being, as it were, excluded from foreign commerce, the Bolivians are obliged to satisfy their wants by their own industry. The manufactures of cotton are the most extensive: the better kinds are made in Oropesa; but in many districts the Indians make great quantities which are coarse though strong."¹

No words are required to give force or clearness to these facts. The case classes itself with those of India, Mexico, Central America, and Ecuador.

To Brazil we have annually exported goods to the value of 10s. 5½*d.* per head of its population, 5s. 9½*d.* of that amount being in manufactures of cotton. The vastness of the expanse which appears in the map under the name of Brazil, might lead to an apprehension that here the principle I seek to establish will fail. But the provinces of Matto Grosso, Goyaz, and Para, with the better-peopled district of Maranhão,—that is, the country to the west of a line drawn from the river Parana, in latitude 26° s. and long. 55° w., to the coast in lat. 3° s. and long. 42° w.,—which comprises three-fifths of the area of the Brazilian empire, contains but one-eighth of the population. Of the other seven-eighths much the greater number are situated near the coast, and even within that margin to the ocean there are large tracts not occupied by a civilized population, and some scarcely occupied at all. Nor, indeed, does it appear that there is any considerably-populated district further than 150 miles from the ocean, except some parts of the province of Minas Geraes, which are rich in mines, and whose exports consist chiefly of gold, silver, and precious stones. Cheese, of a peculiar kind, is brought also from the province just mentioned, and sugar is sent from the more southerly province of San Paulo; but from the wilder and more distant regions of Goyaz and Matto Grosso nothing seems to be carried to the coast but gold, diamonds, and a little ipecacuanha. The roads from the coast to the interior are few; and from the character of the mountain ranges, which occur at no great distance from the ocean, scarcely any of the ascents are practicable for car-

¹ Commercial Tariffs, part xviii., and Penny Cyclopædia, art. Bolivia.

riages. The journey from Ouro Preto, the capital of Minas Geraes, to Rio de Janeiro, a distance of only 200 miles, occupies fifteen days.

Here, then, as in the case of New Grenada and Eeuador, and the similar one of Peru and Bolivia, we have two distinct portions of country, which afford a strong contrast in the character of their exports. The interior, reached with cost and difficulty from the coast, sends down only goods very light in proportion to their bulk, the littoral provinces supply all the agricultural products, moderately heavy, but not of the coarsest kinds, which constitute the main articles of export. These exports amounted, in 1842-3, to 18*s.* 3*d.* per head, of which five-sixths were supplied by coffee, sugar, and cotton, grown in the maritime provinces, and not far from the coast.

The two remaining cases I have grouped together, because, while they afford strong general confirmation of the views which are suggested by those already discussed, there are circumstances which may possibly be thought to weaken the inference to be drawn from them. They lie in a higher latitude than India; and the imports of Chili may possibly be not entirely consumed in the country, but may form part of the coast traffic, which Valparaiso prosecutes with the other ports on the western side of the South-American continent. Still the results are too remarkable to be entirely overlooked.

Chili differs in the strongest degree from its neighbouring republic, Bolivia. Its territory nowhere extends far from the coast; its population lies nowhere at great elevations, or at great distances from the sea, or beyond any great mountain range. Several navigable rivers traverse the narrow tract between the ocean and the Andes, of which the territory consists; and wheel carriages, rude and ineffective indeed, but still sufficient to show that such vehicles can be used, attest the comparative ease of the means of transit by land. Accordingly, "the facility with which foreign manufactured goods can be imported into Chili has wisely discouraged the establishment of any important manufactures. A large portion of the popu-

lation, however, wear home-made stuffs, especially woollen. The importation of British manufactures is increasing."

To this country our exports have reached to $14s. 2\frac{1}{2}d.$ per head per annum, of which nearly $8s.$ was in manufactures of cotton,—the largest figures in the list. The exports of Chili are not fully reported since 1839, when for three years they had averaged, if the population be 1,300,000, not less than $17s. 6\frac{1}{2}d.$ per head per annum, and they consist less conspicuously of precious metals than in several other countries; gold and silver appearing but for one-third of the whole amount.

No doubt a better Government than that of any other South-American republic has contributed to afford due play to the natural capabilities of Chili, and so has increased both its consumption and its exports; and no doubt also some re-export takes place from Valparaiso, which would diminish the figure here given; but the contrast between the commerce of this country, and that of any other on the western coast of this continent, seems too great to admit of any hesitation of opinion as to the influence of the corresponding difference in its means of transit.

The last case to be considered is that of the States of Rio de la Plata. Our exports to all the countries reached by that river and its tributaries are reported up to 1845 in one item, and amount, on the average, from 1840 to 1846, to $12s. 11\frac{1}{2}d.$ per head per annum, cotton goods affording one-half of the traffic. The war, indeed, since that period has interfered greatly with commerce, and, in 1845, the last year of the series (that which is given in the second table), the amount reached only to $9s. 10\frac{3}{4}d.$; but to unusual times the present argument does not apply; and the average of a period of six years, in which nothing very remarkable interrupted the general operation of interests, cannot but be a fair basis for argument.

The exports of these states are not very clearly or fully given; but there seems to be sufficient authority for estimating those of Buenos Ayres at an average of 1,500,000*l.*, and those of Monte Video at 1,000,000*l.* per annum; and these are the chief

or only places of export: from these sums result an export of 2*l.* 1*s.* 9½*d.* per head per annum, a scale of external commerce far beyond that of any other country of South America, and only exceeded (but very largely exceeded) by that of Cuba. This export, too, consists not of light and precious goods, but of hides, skins, hair, wool, and the various coarse products of herds and flocks. The explanation lies, I conceive, in the unusual facility of internal communication, which is thus described:—"The internal commerce is considerable, as almost every republic produces something peculiar, which is in demand in the neighbouring countries. It is also facilitated by the level character of the country, and its climate, which is generally dry; the roads also are tolerably good. The navigation on the Paraguay River extends north to Brazil, on the Parana up to Apipè, and on the Uruguay up to the Salto Chico, to which places vessels of 300 tons burden may ascend. By this inland navigation the products of the northern republics are brought to Buenos Ayres or Monte Video, whence they are exported. These ports engross nearly all the maritime trade." Two-thirds of the population are located in the states seated by these navigable streams. We can hardly doubt that a country which, ill governed as it is well known to be, could, in the depth of war and distress, maintain with us a commerce, as in 1846, of 4*s.* 9½*d.* per head, and could raise it in 1848, only two years afterwards, to 10*s.* 2*d.* per head, must have advantages, compared with neighbouring countries, beyond those of government, race, taxation, or climate; and these, I conceive, can only consist in the great superiority of its internal communications.

To proceed now to the use to be made of these facts: any deduction which fairly arises from a comparison of these particulars and results cannot but be valuable, since similarity of climate, race, language, religion, and general capability in the ruling classes, and of poverty and subjugation in the rest, prevails to so great an extent in these countries as to rid the argument of some of the chief perplexities which often accom-

pany inquiries of this nature. On review these cases appear to fall into three classes, as follows:—

1st. Those countries in which the power and tendency to export are overborne by the difficulty and costliness of internal transport; these are Mexico, Central America, Ecuador, and Bolivia.

2nd. Those in which the difficulty and costliness of carriage are relatively mitigated by the very small weight in proportion to value, of the exported articles; these are Peru, perhaps some parts of New Grenada, and the interior of Brazil.

3rd. Those in which natural facilities for transport are accompanied by the largest exports; these are the foreign West Indies, Venezuela, New Grenada, Chili, and the States of Rio de la Plata.

I purpose now to show that the operation of the same principles in India produces the same results.

Our total exports to India and Ceylon in the six years 1840–1845, amounted to an average of 6,265,340*l.*; or, for a population of 114,500,000 souls, an average annual export of *ls.* $1\frac{1}{2}d.$ per head, of which $8\frac{1}{2}d.$ was constituted by cotton goods. I fear the means do not exist of assigning with accuracy to each portion of the population of India its share of these goods; but a case or two of considerable significance can be found.

Bombay is much more an emporium for the commerce of many Asiatic nations, and of other parts of India, than the port proper of the inland territory which lies geographically near it. Its commerce is the subject of an annual Report, made on public authority; and by means of two of the divisions of that report we get some insight into the magnitude of its transactions with India itself. One of these exhibits that part of its commerce which passes through the small ports on the main land opposite Bombay; and it represents the traffic with the Concan, the Deccan, Candeish, Berar, and Hyderabad. Now this traffic amounts on an average to not more than one-

sixth of the entire external commerce of the port of Bombay; that is, if the continent of India, opposite to Bombay, for a space of some 400 miles from north to south, and the same from west to east, were a desert or a sea, the port would lose but one-sixth of its present trade. Bombay trades with very distant countries by sea, with far greater ease and facility than it does with the interior of its own presidency, and the adjoining native states.

The following will give an approximate view of the absolute amount of the traffic of Bombay, with its proper geographical interior. By the care of Mr. R. W. Crawford, there was laid before the Committee of the House of Commons on Indian cotton, in 1848, an account for the ten years following 1836-7, of imports at Bombay, of British cotton manufactures, and of the re-export of them through the Concan and Guzerat¹. From this account it appears that for the six years I have adopted as the period for examination, the average export of cotton goods from Bombay through the Concan (which, as I have stated, is the only route to the interior locally connected with the port,) amounted to 171,392*l.* per annum. The population so reached is about 11,206,100, as I found reason to conclude in my inquiries on the salt trade for the Great Indian Peninsula Railway Company², and I believe this estimate has not been controverted. These figures give 3·6707*d.* per head per annum, as the rate at which we supply *cotton* goods to the inhabitants of the peninsula of India, as reached from Bombay. Further, an examination of the report of the Chamber of Commerce of Bombay, for 1843-4 (the only one I at present possess), shows that the other goods of British origin, which are sent from Bombay by the same way into the interior (omitting a few articles clearly for the use of Europeans), amount as nearly as possible to the same sum as the cotton goods. Consequently, twice 3·6707*d.*, or about 7½*d.* per head per annum, may be taken as the gauge

¹ Report of 1848, page 91.

² Report, Maps, and Papers, pages 42, &c.

of the supply of British goods of all kinds to Peninsular India in the latitude of Bombay.

Now it must be remembered that the general average for India is 1s. 1½d. per head per annum for all goods, out of which is 8d. for cotton manufactures; while the local average just exhibited is but 7½d. for all goods, and 3½d. for cotton; that is, the countries supplied from Bombay through the Concan take but half as much as the average of all India. The causes, or at all events the like facts which in all other cases have been followed by like consequences, are clear. The Ganges supplies to the great seats of population in the north of India a means of carriage not possessed by the country opposite to Bombay; the means of carriage in Peninsular India are everywhere of the rudest kind, and the routes to be traversed between Bombay and the interior are the worst of all.

The export-in-payment which Peninsular India now effects is dependent on the same principle which enables Peru, with her terrific roads, to buy foreign goods; as in one case silver, so in the other cotton, answers this purpose. I have already attempted (chap. III.) to show that the cost and difficulty of internal carriage are the real causes acting at the present day which prevent the extension of the export of Indian cotton. Grain in Berar is from six to ten times as heavy for the same value as cotton; if, then, to carry cotton to profit be often impossible, we may well conclude, even without more particular information, that to carry grain to any distance must always be far beyond hope. The possibility of export trade from the interior depends, with the present means of transit, on the possibility of converting the value of rough and cheap agricultural produce into value of other and lighter forms; a dependence to which our commerce ought not to be liable when so certain a remedy as improved transit can be applied, and which is very little likely to be relieved by any other expedient.

It has been said that grain is grown by preference in the interior of India, as a crop more certain of sale than cotton;

this is not, and indeed cannot be, the case. That it is not, is evident from the following extract, not the only one adducible, to the point. Referring to Hoshungabad, Mr. Mercer says¹, "The grain crops are evidently the staple crops of the valley, considered as a whole; but cotton is the most important in all the villages bordering on the rivers where the land is raviny; and it is the crop of all others, probably hemp excepted, that produces the most ready sale. Grain, indeed, is often a perfect drug, when scarcely any price can be got for it; grain is now selling in some of the bazaars, at retail, at 100 seers per rupee," that is about 100 lbs. weight for 1s.²

That with bad means of carriage grain cannot be, in every case, the article of most ready sale, may easily be seen from the fact that the number of persons to whom the grain can be carried limits the consumption and demand; and, with such a limitation as bad roads impose, an excess of supply operates with extreme severity on the price.

Mr. Mercer, in the page next to that I have just quoted, very justly says, "What the Nerbudda valley wants, to be one of the finest in the world, is the means of investing the value of the labour of the people who are subsisted on its wonderful stores of grain, in articles suited to distant markets; and if Government were to supply the railroad, private European enterprise and skill would make its iron and coal the means of supplying this want."

That this want is in a slight degree supplied by the cultivation of cotton is the sole reason of the capability of Berar to

¹ Return of 1847, page 217.

² The following instance may be added as very recent; the writer is a General Baptist Missionary in Orissa, who dates from Gope, near the celebrated black pagoda of Juggernaut, Jan. 18, 1850. "In tracing the country in all directions to meet the people in their markets, we have witnessed the most amazing crop of rice in the fields I ever saw; nothing can equal it in the shape of a crop, and the consequence is that rice is most extraordinarily cheap. Orissa abounds in immense and rich rice plains, which teem with produce, which cannot be turned into money, and remains in the hands of the rice mahajuns or usurers, to be sold by them for 400 or 500 per cent. advantage, or even more than that, in case of some year of scarcity occurring, or to rot in their storehouses."—*General Baptist Repository*, July, 1850, page 332.

maintain any export trade whatever; for few or none other of its products will bear the present expense of carriage; and, because its products will not bear the present expense of carriage, we send into the interior only 7½d. per head per annum of our manufactured goods, instead of eight or ten times that amount.

The same thing takes place with regard to Malwa: formerly it grew grain, now it grows opium, an article so light in proportion to value that it pays not only for carriage, but a large additional charge for guards to accompany it; and Malwa is also thus enabled to pay the carriage of the grain which it now draws from Berar and Goondwana.

These remarks may serve to show that the increase of the consumption of our manufactures in the interior of India, as far as it is connected with Bombay, is strictly, and not very remotely dependent on improvement in the means of transit; and, besides answering this main purpose of my argument, they may also suggest that any expectation of an improved government revenue from increased growth of grain, without an increased export trade, must be altogether futile. Greatly-increased crops of grain in the interior, without improved means of carriage (or indeed the rise of local manufactures, or the growth of new light articles of general use, neither of which is to be expected), would be as useless as they would be in the elevated valleys of the Andes, without the silver mines¹.

The commerce of Madras is not like that of Bombay. It is not that of a great commercial centre, but is connected in a much greater proportion with the country immediately inland to the Presidency and the other ports. Its transactions, about

¹ A fact somewhat connected with the subject should here be noted. The goods received at Bombay from the interior far exceed, in value, those dispatched thither: in 1842-3, the value of the former was 1,714,700*l.*, of the latter only 725,937*l.* The difference is necessarily reserved to meet the value of the salt made on the coast and carried into the interior; and this most indispensable article will always occupy the greater part of the means of carriage in that direction, while they remain on their present scanty footing.

one-fourth of those of the same scale as those of the [redacted] were deprived of its extra Indian commerce.

We shall probably be not far from the truth, if we deem the area affected by the commercial operations of Madras in the interior, as about coincident with the political extent of the Presidency; the population of this area has been estimated at 13,000,000 for the British territory, to which should be made some additions of inferior and uncertain amount for districts under native government. With the above-mentioned amount of population, however, for a basis, and an import of English goods, as in 1841-2, of only 360,661*l.*, we find that our transactions with the natives of this part of India amount to but 6*·*658*d.* per head per annum, of which 4*d.* is in manufactures of cotton. Here, again, difficulty and cost of transit have kept down both the enterprise of England and the profit of India; but, although the general state of the case is sufficiently known to warrant this conclusion, I am not sufficiently informed of particulars to enter on a discussion of them.

Turning now to Calcutta, we shall find strong indications of the effect of a different set of facts, notwithstanding considerable uncertainty as to the actual figures to be employed. It is not easy to say where, in the centre and north-west of India, European goods from Calcutta meet those from Bombay sent through Guzerat; but we may assume, with some probability of being nearly correct, that a population of about 60,000,000 receive their goods of this kind through Calcutta. This figure would assign to the commercial connection of Calcutta somewhat above half the population of India, and it is consistent with the other suppositions employed in this argument. On this assumption, the supply of English goods to Calcutta, in 1841-2, amounting to 3,855,180*l.*, was only 1*s.* 1½*d.* for each inhabitant, of which 7¾*d.* was in articles of cotton. This conclusion is perfectly consistent with our former results; for in the years

1841-2, to which the absence of further information confines these remarks, our exports were only $11\frac{1}{4}d.$ per head per annum to the whole of India, although the average of the six following years rose to the sum given in the table; the excess above that average of $11\frac{1}{4}d.$ which is here shown may be roughly taken to compensate for the deficiency in the Presidencies of Madras and Bombay. No correction, however, which this calculation can possibly admit, can obliterate the very clear indications afforded by the double consumption per head of our goods in the valley of the Ganges: that river and its branches afford means of transit enjoyed nowhere beside in India; and the result is that, man for man, the inhabitants of its banks deal with us twice as largely as their fellow-countrymen in any other quarter. Advantageous, however, as is transit by the Ganges, compared with that in other parts of India, yet it is so disadvantageous, from length and difficulty, in comparison with that enjoyed by the coasts and islands of South America, as to account for the import of our goods by the Gangetic valley being so much lower than theirs, and to show why it so nearly resembles that of the worst-situated parts of the American continent.

Reviewing now these facts, we can scarcely doubt that the same causes which, notwithstanding similarity in every other essential respect, operate to keep down our exports to some parts of South America so much below those to others, and also to keep the consumption of our goods so much lower in some parts of India than in others, are just as potent in keeping our whole commerce with India down to its present low level. For anything which yet appears, there is as little reason to conclude that India should not rise to the level of Venezuela or Brazil, as that Mexico should not do so, if due facilities for transit were provided. No aspect in which the question can be viewed seems to afford an escape from the conclusion that the same considerations, and no other, affect both cases; and that if it be want of facilities of exchange, which, notwithstanding *similarity* of race and habit, keeps Mexico and Cen-

tral America below Venezuela and Peru, the depression of India to the same point as Mexico may be safely attributed to the action of the like causes, independent of any *difference* of race or present habit; and this argument is greatly strengthened by the ascertained fact that, within India itself, where differences of race, habit, or government cannot be alleged, the very same cause, viz., difference in the facilities of exchange, produces precisely the same effects as elsewhere in varying the amount of commerce.

In order, however, to avoid unduly pressing the argument, let us now take a comparison on a larger scale. All India and Ceylon, in the years 1840-5, took from us goods, on an annual average, to the amount of 6,265,340*l.*, or 1*s.* 1½*d.* per head per annum, of which 8½*d.* was of cotton manufactures. On the other hand, group B of Table I., which consists of the South-American countries most fitting for the comparison, took from us at the rate of 7*s.* 8½*d.* per head per annum, of which 4*s.* 1½*d.* was of cotton; and, to take this group altogether, rids the argument of some questions connected with boundaries and re-exports which might be alleged to affect the conclusion. If, however, we exclude Ecuador and Bolivia, as too nearly affected by circumstances like those of India to be admitted fairly into this comparative argument, we shall find that the average of group B rises to 8*s.* 6½*d.* per head per annum, to which 4*s.* 8½*d.* is contributed by cotton; or if we include the whole South-American continent from the isthmus of Panama to the southern frontiers of Chili and the States of the Rio de la Plata, we have very nearly the same result; the two last mentioned states, by their great facilities of transit, and consequently by their large commerce, compensating for Ecuador and Bolivia, which were excluded from the preceding comparison.

It can hardly, then, be far from the truth to say that each South American—Spaniards, Portuguese, mixed classes, Indians, slaves, and all included—now takes from us eight times as much in manufactures as each inhabitant of India; and the facts go far towards showing that this disparity arises from

Similar causes of the same nature in both cases which affect India in a greater degree than South America. This cause is not climate, caste, government, religion, taxation, or indifference to improvement or enjoyment, but the want of sufficient means of transit; and the remedying of this evil might reasonably raise our exports to India to at least eight times their present amount.

Nor is it without bearing on the present question to remark, that while India is evidently as capable as other tropical countries of benefiting by the use of the manufactures of England, and of other articles foreign to its own soil and labour, its industrial feebleness is such that its export, that is, its power of paying for such, falls far short of that of any country of South America, and scarcely exceeds 2s. 3d. per head per annum; and to this it should be added, that while South America contrives to export at least as much as pays its taxes, India, more lightly taxed by one-half, earns not more than half of that smaller burden by means of exported products.

I am ready to allow that the proportion between our exports to South America and those to India is established only on probabilities and analogies to which objection may possibly be taken; for neither the nature of the subject, nor the character and extent of the available evidence, admit of more positive conclusions: nevertheless the facts seem to me fully to warrant, for practical purposes, the inference which I have drawn from them; and I shall take as sufficiently established the probability that, with suitable and sufficient means of internal transport, India would take from us eight times as many manufactured goods as at present, before any material check was felt from climate, usage, or inclination of the people.

But while our total exports to all the world amount to about 56,000,000*l.* sterling per annum, those which we send to India, in part of that whole, are about 6,000,000, or one-ninth. If, therefore, we could raise our exports to India to eight times its present amount, we should export to that country as much as

to all the world beside; that is, we should double our present amount of exports. This result I believe to be dependent on the establishment of sufficient internal means of carriage and travelling in India; not indeed dependent *exclusively*, so as at all to preclude questions of government, taxation, education, &c., but in such a sense as that no other improvement or improvements whatever can be substituted for it, or can be made to produce its proper, peculiar, and indispensable effect; and in such further sense, as that all other improvements would be greatly promoted by this.

It is perfectly needless to say a word on the desirableness of such an increase of our exports, whatever might be the quarter from which it came; but circumstances affecting the peculiar importance of India to our commercial system may justify some enlargement.

None will doubt that an extension of our present markets is becoming more than desirable—it is necessary. Europe and the United States are manufacturing for themselves, while our own capital and population are annually increasing, and are pressing with annually-increasing force on the openings for occupation. The waste of the railway madness, notwithstanding its wildness, and the panic of 1847, notwithstanding its severity, are already succeeded by a plethora of capital; while multitudes of intelligent and energetic men are idle or half employed.

If we look to foreign states for scenes of occupation, we find ourselves too often met with a meddling or obstructive policy; we are not always treated with good faith in detail. Our progress may at any time be interrupted or our people ruined by the measures of governments accessible to no sufficient salutary influence. And while no doubt the energy of our countrymen does and will establish their undertakings in every practicable clime, it cannot be denied that these difficulties constitute considerable drawbacks to the inducements which should lead us to occupy the fields of enterprise presented by

foreign states, as well as obstructions and limitations which only the unusual energy, skill, or opportunities of a few can overcome.

Beyond these considerations is that of the amount of population in any given country—one of the most important elements in the calculation. Without adequate population to begin with, neither natural fertility nor convenience of transport can afford more than a field which exertions begun now may have elaborated, at some future time, into an eligible arena for further effort. In thinly-peopled or newly-settled lands, everything must at first be on a small scale and move slowly; such countries present no opportunity or inducement for the costly and extensive undertakings which the full employment of our accumulating means requires, and for which a populated country would amply pay. In time, no doubt, other advantages would bring on that of a due population; meanwhile, however, substantial prospects would be wanting, except for moderate undertakings very favourably situated. Want of population, I apprehend, will be the check first arrived at on an extension of enterprise in many countries otherwise very eligible for it; a check, it is true, which continually, though slowly, recedes, as previous difficulties are surmounted.

We are trying to relieve ourselves by colonization: but if we send away 300,000 souls a year, we shall remain at home in numbers but as we were; and these, as customers, must increase at an extraordinary rate to give us 5,000,000 of additional customers in fifteen or twenty years; a result which, while far beyond probability, would be more than overtaken by our usual increase of capital. And even 5,000,000 of British colonists for customers would not be of above one-third the value to us of India rightly brought into action.

Without, then, discouraging enterprise in other directions, or undervaluing other fields of effort, it may be said that India appears to be invested with peculiar importance to our interests,

and to possess facilities as peculiar for promoting them. We mould its policy, and we can take care that no narrowness of principle shall long obstruct us; we guard its peace, and we can take care that no turbulence shall long molest us; we teach its people, and we take care to sow the seeds of the intelligence requisite at once to their elevation and our profit: there is already a population vast in numbers, submissive in a good degree to order, able and willing to reciprocate our approaches, if only we take out of the way the merely physical obstructions which now keep us asunder. We have not here to wait the discovery of new lands, the raising up of new populations, the establishment of new friendships, or even the admission of new principles of economic policy. We want little more than the means of communication; all else that is wanting will follow.

I cannot refrain from stating a view of our commercial position which, perhaps, I hold almost alone, but which, if correct, invests the magnitude of the population of India with singular importance to our interests. We have been startled and perplexed at intervals since the peace, by the repeated occurrence of commercial panics. The theory of these convulsions seems not to be generally agreed on; and indeed they have been to some extent considered either uncontrollable paroxysms, as little to be foreseen or guarded against as an earthquake, or the results of a periodical accession of extreme and culpable hope and adventurousness. I venture to suggest another view of the case.

Our effective manufacturing energy consists of two parts, each of which is indispensable to the activity and productiveness of the other; one is our capital—the other, our personal capabilities, whether of body or mind. Neither is productive when alone; the effect depends on their union. Now our personal capabilities seem to be greater than is requisite to match with our capital; that is, when all our actual capital is employed, and has associated with itself its complement of personal capability, there is a surplus of the latter still wanting occupation, and

by so much is our total national effectiveness below what it would be with additional capital to match this surplus.

That the defect (in a comparative sense a defect) is on the side of capital seems tolerably clear from the fact that immediately on the use of credit in extension of capital our productions increase; and they increase far too suddenly to permit the supposition that their increase has depended on and resulted from an increase of personal capability, for that capability is necessarily of much slower growth. The very suddenness of our occasional increase of production is proof, I conceive, that our capital, vast as it is, still is short of our personal capability of employing it.

When, however, under the inducements supplied by unoccupied personal capabilities, credit comes largely to perform the office of capital, our total production is suddenly and greatly augmented; and this is done without any very distinct view being had, at the same time, of means and channels of disposing of the augment of production, so as to redeem the credit on which it was made. We send away the goods merely in hope of sale.

. But, in fact, we are dealing with little more than the coasts of the world, and, generally speaking, we have no sufficient access to its interiors. A Manchester cotton handkerchief at Timbuctoo, or a Sheffield razor at Bokhara, may serve to give a poetical idea of the depths of continent to which British products can penetrate, but they afford no evidence to counter-vail the facts which show that our goods are not generally bought or used by the vast masses of people which are located far from coasts and navigable rivers.

The coasts of the world, however, afford but a limited market; and the amount of goods which our personal capabilities, when all set to work can produce, soon chokes them; and so much the more rapidly and severely, from the augment having come on too suddenly to permit even such use of the interiors as perhaps might in time be made of them, under present circumstances. The choked coast markets afford only

slow demand and insufficient prices, and the goods consequently do not redeem the credits on which they were made. The workman and his employer, unable to wait the issue, had meanwhile sold their interest in the matter at rates accordant with the hopes of the day; and the loss falls on the merchant and banker, and through them on parties who had nothing to do with the original transactions.

So long, then, as we have only coast markets (necessarily very limited both in their population and in the acceptable products by which they can purchase our goods), and cannot rely on the requisite mercantile access to the populations which are seated far from the sea, while, on the other hand, our productive energy remains liable to great and sudden augmentation, by bringing into play, through the use of credit, our excess of personal capabilities beyond capital, I apprehend we shall have reason to expect a recurrence of commercial crises.

If this be so, the natural remedy lies in gaining access to the interiors; for I apprehend that the force of the "prudential check" will not long keep down production; and its effect will obviously always become weaker as the sufferers and witnesses of the next preceding crisis become fewer and less active; we have therefore only to rely, in the long run, on the ordinary operation of common motives. To provide for the employment of our activities, and not to restrain them, cannot but be the safer policy; and this, if the foregoing remarks have any truth in them, requires not merely that we strive to obtain extended markets of some kind, but that we look well to the means of penetrating with our commerce to the inland seats of population.

How far, indeed, disaster may induce caution, so as artificially, for a time, to keep down production, it is not easy to predict; but if it were as certain to succeed as it is likely sooner or later to fail, none could doubt the greater desirableness of a scheme of action, if such were practicable, which should give us all the activity of our periods of confidence, without the dreadful collapse which has hitherto followed them:

the practical attempt for this purpose (an attempt which, even if it failed for this particular end, could not but accomplish great good of other kinds,) would be, I conceive, to open to our traffic, by cheap and easy means of transit, the great inland countries of the earth.

In this view India is pre-eminently valuable to us. South America has yet to people much of its vast interior. Africa presents other difficulties in conjunction with those of transit, which time only can overcome. China is yet to a great extent locked against us by fear and prejudice. Japan is still more firmly closed. The countries between India and China afford for the most part but unsafe and uncongenial fields for European enterprise. In all these quarters, although much may and probably will be done, we have everywhere to confront difficulties which in India do not exist. Nothing but our own timidity, induced by a want of knowledge of the facts, stands in the way of our making India, with considerate but not sleepy speed, a vast scene of British enterprise, to the great advantage of ourselves, and the still greater benefit of the natives.

As in the rest of the world, beyond Europe and North America, so in India we have dealt with little more than the coasts and the neighbourhood of a few navigable rivers: and, I apprehend, that although some specimens of British commodities might doubtless be found in its most central districts, yet the greater part of our goods is consumed within comparatively short distances of the sea; probably our commerce is limited not so much by the smallness of the consumption by each person, as by the smallness of the numbers of persons who, from distance, can obtain our goods at all; and it must be remembered that the coastward districts of India are not generally the most populous. The Hindoos rarely carried on commerce by sea, or located themselves with a view to its convenience. The great seats of population were, anciently, in the interior, and the cities which have sprung up around the centres of our own power scarcely disturb the former average distribution of the people.

To carry, then, reasonable means of transit into and across India, would be to convert the vast population of the interior, from subjugated aliens of strange habits, into customers and correspondents; and the gradual but certain reaching of the successive portions of their land, with the equally gradual but certain imbuing of them with the desires which would stimulate their industry, and the knowledge which would direct it, could not fail to afford us a market, whose expansion might for a long time correspond in some degree with that of our own capabilities; and great, indeed, would be its value to us, if it only mitigated those terrible commercial convulsions, which have carried sorrow into innumerable families, and have given, in some measure, a character to the age. If the impending outburst of enterprise should take a direction calculated only to increase our productions, or to carry them with greater cheapness and facility to the *shores* of other countries, we may look indeed for a certain measure of prosperity; but, if I am not mistaken, that prosperity will be chequered and limited by renewed convulsions. But if that outburst should include, in due degree, the extension of the means of *internal transit* in other countries, and especially in India, I believe we may safely anticipate that at a time probably not very distant our course will become comparatively free from those disastrous periods.

However the importance of railways in India may be admitted on general considerations, it is hardly possible to suppose that the views I have now expressed will meet with unchallenged assent. Happily, the reasons for urging with all energy the prosecution of these enterprises are too numerous and varied for any difference of opinion on one, or even many, of them, to weaken materially the effect of the whole. Perfectly at ease then as to the influence of this discussion, while I am convinced of the truth and importance of the opinions I have expressed, I submit these views, believing that, even if mistaken, they will suggest reflections which cannot fail to be useful, and if true they may assist in obtaining attention and energetic prosecution for undertakings which have been too little ex-

amined and understood by the British public, and the support of which has hitherto rested too exclusively on extrinsic ground.

AUTHORITIES AND REMARKS—TABLES I. AND II.

It may prevent confusion to repeat that while Table I. is founded, as to the exports from England, on the average of the years from 1840 to 1845, both included, Table II. exhibits the commerce of only the last-mentioned year: hence some merely apparent difference in results. The object of the former table is to give a fair general view of the average commerce; that of the latter, to exhibit the principal items of which our commerce with each country consists.

The reduced values are carried to the fourth decimal of *ld.*, merely to obviate the necessity of giving another table with the actual values of the exports. It is obvious that those values can easily be recovered, with sufficient accuracy for general purposes, by multiplying the personal consumption by the population.

INDIA AND CEYLON:—

<i>Population</i> —India, Commercial Tariffs, part xxiii., page 264 .	113,000,000
Ceylon, " " " 695 .	1,500,000

114,500,000

British India only, about	70,000,000
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Taxation—Taken for the year 1845, Parliamentary Paper No. 188, of 1847, page 6. Of the gross sum of 22,074,768*l.* about three-fourths appear to be collected from our own territories exclusively, and one-fourth is derived from customs, salt, &c., which affect the whole population of India; the personal taxation is stated in the table accordingly.

Exports—Amount for 1841-2, the latest available for all the Presidencies. Commercial Tariffs, xxiii., pages 177, 182, 191;—taken as derived from the population of all India.

MEXICO:—

Population—Commercial Tariffs, xvi., page 9. Thomson's Mexico, page 187.

Taxation—Commercial Tariffs, xvi., page 248. Thomson's Mexico, page 196.

This sum is taken as 17,000,000 dollars of acknowledged taxation, and 7,000,000 dollars of embezzlement. The expenses of the Government come to about 22,000,000 dollars. Commercial Tariffs, xvi., page 248.

Exports—Commercial Tariffs, xvi., page 271. Thomson's Mexico, page 189.

CENTRAL AMERICA:—

Population—Very uncertain. Commercial Tariffs, xvii., xviii., page 62. Of taxation or exports I have met with no information.

In Table II. the values of our exports to this country are taken for 1847, the commerce during the six years selected, viz., 1840-45, having been too

small and disturbed to admit of being represented. The direct exportation from England is increased in this table in a few items, by the re-export from the West Indies.

CUBA AND THE FOREIGN WEST INDIES:—

<i>Population</i> —Cuba, Commercial Tariffs, xx., page 68 . .	1,007,624
Porto Rico, „ „ „ 119 . .	500,000
French Islands and Guiana, „ 145, &c. .	284,498
Dutch Islands, „ „ 156, &c. .	19,769
„ Guiana, xviii., „ „ 183 . .	83,000
Danish Islands, xx., „ „ 159 . .	41,200
	<hr/>
	1,936,091

Taxation—Taken for Cuba only for 1847; amount, 12,808,713 dollars equal to 2,561,743*l*.

“Of this revenue it is stated 1,500,000 dollars are applied to the civil service, including the ministers and consuls of Spain, in North and South America; 4,500,000 dollars for the military; 1,250,000 for the marine; and the remainder remitted to Spain.”—*Madden's Island of Cuba*, page 196.

Exports—Taken for Cuba only for 1842. Commercial Tariffs, xx., page 84.

Comparing the amounts of five years previous to 1844, Commercial Tariffs, xxi., page 193, with the other accounts of our traffic with the Foreign West Indies, it appears that Cuba is a better customer to us per head than the other islands, in the proportion of about 11 to 7.

HAYTI:—

Population—Commercial Tariffs, xx., page 5.

Taxation—Average of 1840 and 1841, a period of civil war, page 56.

Exports—Page 62.

COLUMBIA:—

<i>Population</i> —New Grenada, Commercial Tariffs, xviii., page 153 .	1,360,000
Venezuela, „ „ „ 159 .	887,168
Ecuador, „ „ „ 192 .	550,000
	<hr/>
	2,797,168

Taxation—New Grenada, Commercial Tariffs, xviii., page 314.

Venezuela, „ „ „ 354.

Ecuador—no information.

Exports—New Grenada, Commercial Tariffs, xviii., page 323.

Venezuela, „ „ „ 343.

Ecuador (average of 1843 and 1844), „ 355.

In Table I. the direct export from England is augmented by 243,269*l*., the value of the re-export of British goods to Columbia from the West Indies, of which 162,163*l*. was of cotton goods. The united value of the direct export, and the re-export, is that given in the table.

In the column Columbia, Table II., the direct export from England has been increased by the re-export in 1845 of British goods from the West Indies, which are as follows:—

Cotton manufactures	. . . .	9·6769 <i>l.</i>	per head.
Linen	„	3·2244	„
Silk	„	0·2370	„
Woollen	„	0·7912	„
Hardware	„	0·4058	„

The re-exports to other countries of South America are too small to require notice.

PERU:—

Population—Commercial Tariffs, xviii., page 222.

Taxation—No information.

Exports—Commercial Tariffs, xix., page 362.

BOLIVIA:—

Population—(Very uncertain; estimates vary from 500,000 to 1,500,000).

Commercial Tariffs, xviii., page 251.

Taxation—No information.

Exports—Commercial Tariffs, xix., pages 371, 372.

Our exports to Peru and Bolivia are classed together in the returns of the British customs for the period under discussion. Strictly, the figures given in Table II., under the head of Peru, are not quite accurate, and, perhaps, cannot be made so. Since the imports of foreign goods into Bolivia are very much less than those into Peru, while the population of the former is so uncertain as to afford no safe basis of calculation, it appeared likely that the smallest error would be committed by attributing all the goods to the consumption of Peru, and appending this explanation. The entire import of Bolivia, from all countries, does not much exceed 300,000*l.* per annum, of which only part is from England: nine-tenths of the payment is made in silver. Commercial Tariffs, xviii., pages 371, 372. Macculloch's Commercial Dictionary, art. Lamar.

BRAZIL:—

Population—Commercial Tariffs, xxi., page 47.

Taxation— „ „ „ 181.

Exports— „ „ „ 179.

Of the amount of 7·9741*l.* per head, in Table II., Brazil, under the title of goods enumerated in the official tables, but not in this, the following are the principal items:— *d.*

Beer and Ale	. . . . .	1·4519
Butter and Cheese	. . . . .	8·5192
Leather, wrought and unwrought	. . . . .	0·5488

CHILI:—

Population—Commercial Tariffs, xviii., page 256.

Taxation—No information.

Exports—Commercial Tariffs, xviii., page 374.

STATES OF RIO DE LA PLATA:—

Population—Commercial Tariffs, xviii., page 289.

Taxation—No information.

Exports—Commercial Tariffs, xix., page 398, and Macculloch's Commercial Dictionary, art. Monte Video.

BRITISH WEST INDIES:—

Population—Parliamentary Paper, No. 426, of 1845, page 6.

Taxation—

Exports—Tables of Population, Revenue, &c., of the United Kingdom, xiv. and xvi.; average of 1842-3, 1845.

In Table I. the average of our annual exports to the British West Indies in the six years 1840-45 was 2,798,916*l.*, from which I deduct an annual re-export of 311,093*l.* A deduction of the same nature is made in respect of cotton goods. The quantities in the table are those left for consumption in the British West Indies, on the average of the six years specified.

From the values of goods exported to the British West Indies in 1845, as given in the Tables of Population, Revenue, &c., xv., sect. A., page 104, &c., have been subtracted the re-exports from those islands, as given in part xvi., pages 277, &c., to the following amounts per head:—

	<i>s.</i>	<i>d.</i>		£
Cotton manufactures . . .	3	6·2050	or	156,375
Iron and steel „ . . .	0	2·5260	„	9,359
Linen „ . . .	1	4·3178	„	60,458
Silk „ . . .	0	1·0424	„	3,862
Woollen „ . . .	0	3·6936	„	13,685
	5	5·7848	„	243,739

The quantities in Table II. are those left for consumption in the British West Indies, in the year 1845, after subtracting the foregoing re-exports.

In the same table the large amount of 13*s.* 4·1123*d.* per head per annum, not given in detail, is made up of the following items:—

	<i>s.</i>	<i>d.</i>		<i>s.</i>	<i>d.</i>
Bacon and Hams	0	7 3953	Brought up	8	9 5676
Beef and Pork	0	4 3052	Painters' Colours . . .	0	5 3166
Beer and Ale	1	6 4417	Plate, Plated Ware, Jewel-		
Butter and Cheese . . .	1	10 9787	lery, and Watches . . .	0	3 6002
Cordage	0	5 3935	Salt	0	0 8086
Fish (Herrings)	0	0 3409	Soap and Candles . . .	2	11 8380
Hats	0	3 5460	Sugar (refined)	0	4 8909
Lead and Shot	0	2 4043	Tin, unwrought	0	0 2704
Leather, wrought and un-			Tin and Pewter Wares,		
wrought	2	9 6577	and Tin Plates	0	3 8200
Saddlery and Harness .	0	7 1043			
	8	9 5676		13	4 1123

CHAPTER VI.

DISCUSSION OF CERTAIN FACTS AND PRINCIPLES INVOLVED
IN THE LINE AND PROCEEDINGS OF THE GREAT INDIAN
PENINSULA RAILWAY COMPANY.

IF the foregoing chapters are not greatly in error, as to both facts and inferences, it is hardly possible to overrate the importance of improved modes of communication in India. Much indeed has been said on this subject, especially of late; while it is almost superfluous to remark that little real progress has yet been made in respect to it. Not much, indeed, seems to be generally known or felt as to the facts, whether as to construction or traffic, which must influence the practical steps to be taken; and yet it is upon these facts that the success of the whole system of effort, and the realization of its consequences, depend.

If I endeavour to assist in establishing a stronger, because a better-informed,* public opinion in England, on this momentous subject, I shall confine myself, as to local and practical questions, almost entirely to a discussion of the facts connected with the railway system of Western India;—not, indeed, as undervaluing railways in other parts of India, nor as discouraging the extension of common roads, nor as adverse to the making the best of the very scanty lines of possible river navigation which Peninsular India possesses; but rather in the belief that a tolerably complete and accurate exposition of matters, with which years of willing attention, and the fulfilment of responsible duties, have made me familiar, will better serve the general cause than a looser disquisition on

matters spread over a wider field. I believe, also, I shall be forgiven if I add that, as the book published some time ago by Lieut.-Col. Grant, of the Bombay Engineers, gives forcible and talented expression to what I deem serious errors which are generally entertained, and opposes the designs which I felt it my duty to recommend, it seems to me that the discussion on local questions will be most conveniently conducted in the form principally of an examination of that book. The disadvantages of a polemical mode of expression will probably be more than counterbalanced by having before us the actual views of one who has so well and so fully expressed what others have hinted at or approved.

The progress made by the public mind in respect of the application of the railway system to the circumstances and wants of India is attested at least by the existence of a considerable amount of discussion and of diversity of opinion. Possibly, while I deeply regret the great delay which has taken place in the practical adoption of the system, I may appreciate more vividly than others the evidence of a growth of attention and of earnest wishes which this diversity of sentiments affords. In 1842 and 1843, when my solitary efforts commenced, the greatest difficulty was to meet the incredulity and even ridicule with which my statements and suggestions were almost everywhere received. First, however, a few of those who, from long residence in India, were the best informed and the most anxious for the improvement of the country in which they had spent so much of their lives, gave me encouragement and imparted aid. Afterwards, in 1844, it became practicable to form a Provisional Committee. But even in the following year, 1845 (memorable for the extent and character of its speculations), so small a sum as 2400*l.* could not be raised in London in order to dispatch me to India, except by giving the contributors an enormous contingent interest to induce them to encounter the risk ; notwithstanding that, at that early period, the facts as to traffic were so ascertained as only to be confirmed by subsequent investigations :—so great was then the

general ignorance of Indian subjects, and the timidity consequent upon it.

Nor in India itself were opinions less discouraging. A line in the neighbourhood of Bombay had been proposed, examined, and abandoned. Differences of opinion had arisen out of the proceedings connected with that line; and public men, who were earnestly desirous of the improvement of the country, doubted or denied the possibility of constructing or maintaining railways there, or, if constructed and maintained, that such works would pay. Not one practical step had been taken when I reached Bombay, in Sept., 1845, except making some preliminary surveys and estimates for the then-abandoned line. As to the passage of the Great Western Ghauts by railway, on which to a great extent the value of any line in Western India must depend, its possibility was positively and very generally denied; while, in deference to an equally ripe and decided opinion, that natives would never travel by railway, I found it necessary, in forming the estimates of traffic, to leave out of account every shilling we might hope to derive from the conveyance of passengers.

The investigations, however, of 1846 seemed to put an end to this state of things. The principles by which it appeared to me we were most likely to discover the best point, perhaps the only one, for crossing the Ghauts, and so for determining, in an engineering view, the general course of the line, were so zealously, skilfully, and successfully worked out by Mr. Clark and Mr. Conybeare, that no doubt was left as to the practicability and preferableness of the course proposed; while the line so preferred, for engineering reasons, was found to be on the whole better adapted than any other, *as a first line*, to meet the wants of the country, and to insure, if any could, due returns to the shareholders. At the same time documents of undoubted trustworthiness, prepared for the most part originally for the ordinary purposes of the Government, and not for those of the railway, showed, beyond reasonable doubt, that the amount of traffic (independent of passengers), and the

rates which could be charged for its conveyance without danger of being under-bidden by the existing means of conveyance, would afford ample dividends on any probable amount of capital required for the constructing and furnishing of the line.

From the date of the publication of the reports which exhibited the facts elicited by our surveys and investigations, and their bearing on the prospects of the undertaking, the question has not been, as it was before, "Shall railways be made in the Presidency of Bombay?"—hardly has it been, "What direction shall they take?"—but, "When shall they be made? And under what arrangements for countervailing the absence of knowledge, and consequently of confidence in English and native shareholders?"

Not, indeed, that that stage of the business was passed over without occasional and individual expressions of diversities of opinion as to the direction of the line; for, while I was in the service of the Great Indian Peninsula Railway Company, I received a few plans, chiefly suggested by residents in India, different from that which I proposed, and on which the calculations of the Company were founded. To each and all of these, I believe, without exception, I gave careful examination, and what appeared to me suitable replies; and I think, in each case, the facts, when all taken into account, were so clear against the proposal, that I had no difficulty in saying why, as to my own opinion, I did not concur in it; and I further believe that had these plans been accompanied with estimates of traffic, derived from trustworthy sources, the unsoundness of every one of them would have become manifest to the proposers themselves. If, therefore, I have adhered, as I still do, to a belief that the route by Tannah and the Malsej Ghaut is the best line for the country and the shareholders, it is not for lack of other suggestions; and I trust to be able to show that it is for far better reasons than a mere fondness for my own plans.

Clear, however, as I think the case, when fully understood, is in favour of the Malsej line, and against the route by the

Bhore Ghaut to Poonah, proposed by Col. Grant and others, I neither expect nor wish that it should be adopted without discussion. The world will take its own way on what, rightly or wrongly, it believes to be its own convictions: and, moreover, it is hardly to be expected that a body of highly-intelligent Government engineer officers, resident in the country and charged with its interests, should at once give place to a stranger, who, after sojourning but a year amongst them, ventures to propound and stand by an opinion, and even a set of opinions, very different from any which they had promulgated, or probably so much as entertained. Ready and glad as I am to bear testimony to the handsome and cordial liberality with which every public officer, these included, assisted my inquiries and operations in India (and I believe those of our engineers, Mr. Clark and Mr. Conybeare, also), I can hardly suppose that some of them at least would not take views different from mine; and I cheerfully add they are at least as able, and quite as much entitled, to maintain them.

The appearance, therefore, of the book entitled "Bombay Cotton and Indian Railways," by Lieut.-Col. C. W. Grant, of the Bombay Engineers, to which I have before adverted, although it deals somewhat decidedly with the plans I proposed, and I differ widely from its conclusions, neither surprised nor discouraged me. I take it rather as an evidence of progress, and as one of many proofs that Indian railways, however laughed at seven years ago, will never be suffered to sleep again. Moreover, I am glad of the facilities it affords me for the discussion of the subjects to which it relates. In one respect only does my changed position affect this inquiry:—I have not now command of papers which might possibly assist me; but I believe that I shall be able to adduce undoubted facts which are decisive of the most important points; and, for the rest, I trust my memory will not lead me far wrong.

I am glad to begin by declaring my hearty concurrence in much that Col. Grant has said;—in his description of the advantages to be conferred on Western India by the railway

system—in his anxiety that capital should not be wasted on ornament—in his preference for light engines and frequent trains (from which, however, I do not deduce a preference, as he does, for light roads)—in his regard for the wishes, habits, and advantage, of the people of India—in his solicitude for the pecuniary success of whatever line may be undertaken—and, not least, in his regret that the magnificent volume of water, with which nature every year favours the western side of India, should roll idly and wastefully to the sea. However I may be found to differ from him as to the means of securing the objects of our common pursuit, I cannot but feel that his pursuit of the very objects for which I have long laboured is a strong additional title to the careful examination of his arguments, which his rank and talents would have justly required at my hands; and if these pages should wear much of the appearance of difference, I trust it will be remembered that to state my differences and the causes of them are their very purpose, and that to repeat constantly the many particulars in which we agree would only distract attention from the matters on which no doubt Col. Grant, as much as myself, wishes the truth, whatever it is, should be made known.

It may serve to clear our way to state next a few misapprehensions as to matters of fact into which Col. Grant has fallen.

1. My respected opponent supposes that the estimate of the Great Indian Peninsula Railway Company, of 15,000*l.* per mile for the construction and furnishing, is that of the cost of a *single* line¹, that is, with one pair of rails: not so, it is for a double line, and it is probably even an over estimate for that. It includes, with other items, the materials of a double permanent way, consisting of ballast, sleepers, rails (70 lbs. per yard, at 95 rupees per ton, delivered at Bombay, then thought sufficient), chairs, and keys, amounting to 37,878 rupees per mile.

What has led Col. Grant into an error which so seriously

¹ Pages 58, 60, 117, and 137.

affects some of his principal arguments, I cannot conjecture ; at the same time it is fair to say, that the fact of its being an estimate for a double line seems to have been left to be understood from the universal usage of such documents, and does not appear to have been expressly stated in any paper likely to have fallen into his hands. The error is therefore merely that of too hasty an inference ; yet not the less for that does it vitiate the arguments founded upon it, and with them many of Col. Grant's conclusions.

2. The next misapprehension is that it was intended to fix the *permanent* terminus at Bycullah¹. No such design was ever entertained. But as the views of the Government on the site of the terminus did not agree with those of the merchants, the matter was deferred, even in reference to the longer line originally intended to be undertaken at the beginning ; and when the necessity unhappily arose for cutting down the first undertaking to a line to Callian only, the still stronger reason occurred of not burdening the capital for so short a line with the expense of an extensive and costly permanent terminus. Hence the proposal for a *temporary* terminus at Bycullah : the line stopped there, awaiting further orders.

Much attention was given to this question ; and I took care, when in Bombay, to examine thoroughly one very practicable and eligible design, not with the view of excluding further discussion, but for the purpose then chiefly necessary of satisfying parties in England that at least one acceptable arrangement for a terminus could be carried out at a moderate expense. It appeared to me, however, that Bombay will eventually require two termini, and that these can be cheaply and conveniently obtained. One of them would be situated at Warree Bunder, and be extended by a single line for animal draft across the other bunders, drawing traffic from each ; the other in Back Bay, opposite the Church Gate of the Fort, to be reached by crossing Girgaum, embanking the bay, and recovering the requisite land amongst the rocks, which are dry at low water ;

this line also to be extended for ^{the} ~~the~~ draft, so as to deliver cotton at the Screws at the north end of Colabah.

3. The charge of 2½*d.* per ton per mile for carriage, by the Great Indian Peninsula Railway, is treated by Col. Grant as an unchangeable rate, essential to the pecuniary success of the line¹; contrariwise, it is only an estimated charge, adopted merely because it is the highest which was deemed consistent with securing the traffic to the railway, and therefore the most proper to reckon on and to adopt until experience, as yet altogether wanting in India, might show what modifications were desirable for all parties. That such modifications are practicable is shown by the fact that the estimated cost of working the line with 180,000 tons of goods per annum is but 74,021*l.* per annum for the distance from Bombay to Alloh, or 0·94*d.* per ton per mile²; a cost which is still liable to reduction from the fixed expenses being shared by a larger traffic. All above that estimated cost is applicable to dividend, and may be diminished as may seem advisable. That a diminution of the rate was contemplated from the first is shown by my paper “E, on the cost of carriage by native means, and the rate to be safely charged by railway,”³ in which these words occur:—“For after we have first ascertained the *safety* of the undertaking with this highest practicable charge, we may then have to go over the subject again for the purpose of judging whether that charge, or one still lower, will most conduce to the *prosperity* of the railway.”

Two facts control the charges, and practical skill lies in deducing from the special circumstances of each case the point at which those facts fix the charge of maximum profit; a high charge gives more profit on each ton, but a low one brings a greater number of tons to the line. The true charge is that

¹ Pages 15, 84, 94, 142.

² Letter of J. Chapman to Mr. Crawford, Sept. 1, 1846, in the Report, Maps, and Papers of the Great Indian Peninsula Railway Company, page 23.

³ Report, Maps, and Papers of the Great Indian Peninsula Railway Company, page 49.

which so combines profit on each ton, with the number of tons carried, as to bring a larger surplus than would be obtained from either higher charges or a greater number of tons. My own opinion, held, however, subject to further knowledge and investigation, is that considerably less than 2½*d.* per ton per mile for coarse goods will be the charge of maximum profit on the Great Indian Peninsula Railway.

4. Col. Grant assumes that *all* the traffic between the interior and the coast now passes by the Bhore and Thul Ghauts. This is a common belief with Europeans, but it is far from being correct. These two ghauts are those best known to us; the former, from being on the direct line between Bombay and Poonah, and from having had a constructed road on it about fourteen years; the latter, from having been of late years much improved, and having therefore become the best road to Bombay for the cotton of Candeish and Berar. Under the native rule, which preceded ours, there seems to have been no such pre-eminence of traffic by these ghauts; indeed the works and ancient paved roads of the Malsej Ghaut (the like of which, I believe, occur nowhere else on the Syadree range), and the derivation of its name¹, rather countenance the belief that this was formerly the ghaut of principal use. Careful inquiry in the country, and statements made to me by the best-informed British and native civil officers in the ghaut districts, satisfied me that very much traffic passes even now by other routes than those of the Bhore and Thul Ghauts, and that very slight differences of cost of maintenance of cattle, condition of roads and pastures, &c., &c., divert much of the traffic to any of several different routes. Col. Grant himself supplies a statement at p. 149, which, combined with other well-ascertained facts, confirms this view of the case; for while the traffic of Bombay with the interior, including salt, appears almost entirely on official authority to amount to 180,000 tons per

¹ *Mâl*—goods, wares, merchandise, commodities. *Sej*—series, train, line, regular disposition or consecution.—Molesworth's "Maharatee Dictionary."

annum¹, of which nearly all must pass over the ghauts, the statements given by him, from official sources, show that but 40,544 tons passed the Bhore Ghaut in 1848-9, and but 50,573 tons the Thul Ghaut in eight and a half months of the same year; giving, in all probability, less than 100,000 tons *per annum for both, and leaving nearly as much more to be carried by other routes, notwithstanding the superiority for travelling of these constructed roads. It seems clear that it is from the adventitious circumstance of their having been selected by us for improvement, and not from any natural relation they bear to the sources of traffic, that the Bhore and Thul Ghauts are now the most frequented, yet not the exclusive, passes up the great barrier step between Bombay and the interior.*

5. Perhaps the most important misapprehension as to facts into which Col. Grant has fallen is that connected with the present and possible sources of the supply of cotton². I do not, indeed, see his object in endeavouring to show that a railway into the Deccan will not increase the supply; for, after all, he comes to the conclusion that such a railway ought to be made; and, but for the bearing of a right understanding of the subject on the energy with which such a design may be prosecuted, I might perhaps safely leave the question to be decided by time. Because Guzerat at this time produces two-thirds of the cotton exported from Bombay, he supposes (and is far from being alone in it) that a railway across the Ghauts will not much affect the supply. This error arises apparently from his not being aware that the greatest cotton field of India is the Deccan and Berar, and not Guzerat; and that we do not get adequate supplies of cotton from that quarter, only because if it were grown we have not the means of carrying it away. A parallel drawn from English facts may show the nature and force of the argument. We obtain iron from South Wales,

¹ Report, Maps, and Papers of the Great Indian Railway Company, Paper C, page 31.

² Page 27.

THE COTTON AND COMMERCE OF INDIA.

and carry it away by sea; we know, also, that there is a vast supply of ore, and of all other mineral requisites for the production of iron, in Staffordshire. If we had no roads into Staffordshire, I apprehend that, notwithstanding the richness of the natural supply, we should obtain no iron from it; and, in that state of things, Col. Grant's argument would go to affirm that because our iron came chiefly from South Wales, a canal or railway into Staffordshire would bring us no additional supply;—a mistake easily made by one who did not happen to know the peculiar mineral riches of the latter district. Put cotton for iron,—Guzerat for South Wales,—and Berar for Staffordshire, and the argument is exactly that which has lately been advanced against the utility of the Great Indian Peninsula Railway in respect of the supply of cotton. The very fact to be complained of and remedied is, that immense quantities of cotton do *not* come to Bombay, which are or might be produced for us in the interior, and which would be produced and sent, if a railway existed to obviate the immense disadvantages which now keep down the traffic.

My gallant opponent further says that the line, as proposed, “will not ever pass within 140 miles of Oomrawuttee and the cotton lands of Berar.” Here are two or three errors, expressed or implied. The cotton lands of Berar extend to the western frontier of the Nizam's dominions, and are continuous with those of our territory in Candeish, which the proposed line crosses. Oomrawuttee has not the pre-eminence in the cotton trade which it once had, the trade being now shared with it by the active marts which have sprung up 70 or 90 miles to the westward, and by so much nearer to the British frontier; even if it were not so, 140 miles of transit in that country involves nothing like the cost and difficulty of transit of half the distance in the ghaut country and the Concan;—and, finally, it never was intended or proposed to limit the line to any particular extent, length, or direction, but to carry it and its branches wherever traffic might require and *security* might permit. A continuous line of 200 miles from Bombay, by way of the

Malsej Ghaut, would so overcome the chief difficulties presented by the nature of the country, as to give new life to the industry of the interior, and to the commerce of the port of Bombay; all beyond that, although highly important, would not be indispensable to the great public objects to be first accomplished.

Having already gone fully into the consideration of the various sources of supply of cotton presented by different parts of India, I shall not again enter at length into that subject. If the facts I have adduced have any weight, they will of themselves suggest the practical inferences necessary to vigorous and well-planned action for securing the advantages which they show to be within our own reach. But an argument drawn by Col. Grant from the facts of Guzerat, and applied to the very different case of Berar, requires some attention. This argument is in substance as follows: that as Guzerat, which has cheap carriage by sea to Bombay, cannot compete in cotton with America, neither could Berar, even with the help of a railway, since even a railway would not bring carriage from Berar to so low a cost as that by sea from Guzerat¹. The facts I have already adduced may be taken as a sufficient answer to this argument, since they show that, with a railway, Berar cotton could nearly always have been sold at Liverpool at a profit, in face of American; while, with present means of conveyance, it must often have been sold at a loss. The difference between the circumstances of Guzerat and Berar should, however, be further understood.

Sea carriage from Guzerat to Bombay is indeed cheap, being but three rupees for seven cwt.², equal to 0·088*d.* per lb., or, on the distance, 0·789*d.* per ton per mile; from this rate there is evidently nothing material to be saved by reduction. Guzerat, as I have already shown, does already send to Bombay nearly as much cotton as, with its present knowledge and means of agriculture, it can grow. But it complains that

¹ Pages 12, 15.

² Report of the Bombay Cotton Committee, page 20.

when it has grown all it can, and sold the produce at a price determined in Liverpool by its competition with American cotton, the Government steps in and takes the greater part of the price; and this complaint is made on the authority of the Government's own officer; Mr. Davies stating¹, that out of the value of a candy of cotton, which may be as low as 75 rupees², the Government takes, or rather did take, 48; that is, out of a minimum price of $2\frac{1}{4}d.$ per lb., the Government took $1\frac{1}{2}d.$

Here, then, is plainly a case of over-assessment, which justice to the people requires should be remedied; for Guzerat is probably paying much more than its fair share of the expenses of Government; but from the quantity of cotton already habitually sent from Guzerat, it does not appear that this just reform (which I am glad to learn is commenced) can materially augment the export, except slowly and remotely, by diminishing the poverty and increasing the resources of the people, and so tending to improve their agriculture and to increase the weight of their crops per acre³.

¹ Report of the Bombay Cotton Committee, page 40.

² 30 rupees per bhar, which yields 312½ lbs. of clean cotton; the candy is 7 cwt.

³ Guzerat, which extends round the head of the Gulf of Cambay, is a very level and fertile country, separated from the rest of India on the north and east by mountains covered with thick pestiferous jungles. With an early history, in which facts, fiction, and mythology, leave ample room for conjecture, it affords the first traces of continuous and probable events, about the middle of the eighth century of our era. Four dynasties, and a temporary subjection to the throne of Delhi, bring its affairs down to the time of Akbar; the tale is chequered by the usual varieties of cruelties, rebellions, murders, depositions, adventures, and restorations, with the occasional occurrence of a good king, and perhaps more than the usual proportion of long reigns. Internal dissensions, in which Akbar was appealed to, and the use made of Guzerat against him, by some refractory prince-subjects of his own, gave that politic and enterprising monarch an opportunity, in 1573, of re-annexing the country to the Mogul dominions. In 1664, Sivajee, the celebrated founder of the Mahratta empire, then in the transition state between a freebooter and a king, plundered Surat for six days; and the next year the same city was visited by the French traveller, Thevenot, who found a custom-house, which was managed with the utmost pomposity and inefficiency of office, and which inflicted on those who arrived at it an examination far worse than that now endured at Calais; from this *douane* it was not easy to obtain the release of persons under two days, or of goods

But the case of Berar is altogether different. Good cotton may commonly be bought there at prices varying from $1\frac{1}{4}d.$ to $1\frac{3}{8}d.$ per lb.; a cheapness which, however, is often of no avail,

in much less than a month: the Frenchman accuses the officers of gross and corrupt oppression. At this time "the kingdom of Guzerat" seems to have paid to the Government of Delhi about 1,177,000*l.* per annum (about one-third of the present gross revenues of the Bombay Presidency); but whether this was the total and gross taxation, or the surplus remitted after local charges were paid, does not clearly appear.

This traveller experienced afterwards, in the *Mogul* territories of the Deccan, and still more in those of Hyderabad, the manner in which hawks and transit duties were then collected—a manner which might well justify Abul Fazl in saying, some 90 years before, that these duties were introduced "by the avarice of men who feared not God, to the oppression of mankind;" and his master Akbar, in decreeing (how much in vain) their abolition. They appear even to have survived the subsequent revenue reform of Mullick Umber in those countries.

The irruption of Sivajee was only the beginning of the Mahratta raids into Guzerat; and, in 1724, some regular footing was obtained by the chiefs of that people, in the form of a conceded right to the "chouth," or fourth part of the public revenue, and the "surdeshmookce," or a tenth part besides; both to be collected by themselves. It is hardly necessary to say that this cession was but the prelude of farther encroachments, and of quarrels and fighting in the country amongst the Mahrattas themselves for the booty successively obtained. At the beginning of the present century, brothers were contesting in arms a right, according to Hindoo law, to succeed to the possession of the revenue, and they were not the only militant parties. These contentions occasioned the further calling in of the British, who had acquired Surat 50 years before, and afterwards some other districts, by means which did not always deserve or obtain credit for either good faith or good policy. From 1800 to 1817, this eminently fertile province was a perpetual scene of discord; and districts, or rather their revenues, passed and repassed in bargains between different parties, to the unsettling of all permanent interests and consistent plans. At the latter date, that of the fall of the Peishwa, the country was settled, as to government, nearly in its present form; the Guikwar, a native prince, descended from a Mahratta leader, holds part of the country, and the British the remainder. In those days native chiefs, called Grassias, levied "black mail, and aggravated the mischiefs by disputes amongst themselves as to the right to it, all sides making the cultivator pay when they could; and there were villages and tribes which ordinarily stood out, by force, for formal security against the oppression of the government, before they consented to pay revenue. The same irregular and arbitrary additional taxation was also found here as in the Deccan, and, after vain attempts at amendment, was abolished, in 1844, all over the Presidency.

In 1817, the Collectorate of Baroche, of which parts had come into the possession of the British some years before, was surveyed with great care by Lieut. Colonel

since the ever-varying costⁱ and great difficulty of carriage always render it doubtful whether, even with that cheapness, the merchant can safely venture on the trade, and often, in-

Monier Williams, whose published memoir supplies some of the most important facts connected with the native constitution and usages of that part of India, as well as of the condition of the people, and of the amount of taxation at that time.

The Colecltorate of Surat, which under our government had for some time exhibited symptoms of mismanagement, was subjected, in 1832, to a complete investigation by the Revenue Commissioner, Mr. Williamson Ramsey. It was found that the directions given to the principal collector for necessary improvements in its revenue affairs, had not been carried into effect—that excessive assessments, probably the remains of former misrule, had been suffered to continue—that a corrupt body of native subordinates, the usual accompaniment of excessive assessments, held the management of details—that the declining revenue was only realized by cultivation under force, and sometimes by torture, inflicted by the native officers—and that the chief British officer was ignorant of these doings, being probably content to learn the state of the country exclusively from accounts brought to his office, instead of seeing as much as he could for himself. On this state of affairs being made known, the Government of Lord Clare, at Bombay, immediately removed the principal collector to a smaller district, already too well settled to permit much mistake; and the Revenue Commissioner, zealously aided by the assistant collectors, the lamented Messrs. Chambers, effected a thorough revision of the assessments, and re-organization of the service, the consequences of which soon showed themselves in extended cultivation, increasing comfort, and improved revenue.

When Baroche was surveyed by Col. Williams, in 1817-18, the price of Surat cotton was, in England, from 7*d.* to 20*d.*, and in Bombay not far from 6*d.* per lb.; at the date of Mr. Williamson Ramsey's settlement of Surat, viz., 1832, the price was from 3½*d.* to 5½*d.* in Liverpool, and more than 4*d.* in Bombay; since those dates the price has been as low as 2½*d.* in England, and not much more than 2*d.* in Bombay. The collector of Baroche showed, in 1846, in answer to the inquiries of the Cotton Committee of Bombay, that the greater part of the value latterly realized by the crop of cotton, went to the Government in the form of land-tax; nor could it be otherwise if the settlements above-mentioned, which were made when both cotton and grain bore vastly higher prices, and which justly had much weight and authority, were allowed to have the effect of permanent settlements; and it would not be difficult to show that in other parts of Western India, a permanent settlement, if it had been made some years ago, must have occasioned much suffering, through the fall in the money value of agricultural produce, which has resulted from the general establishment of peace and safety.

Three or four years ago a reduction of assessment was made or attempted in Baroche, by means of a punchayet, or committee, formed of the native hereditary revenue officers of the Baroche and Surat districts. The rates fixed were about 6*s.* 8½*d.* for the best, and 2*s.* 1*d.* for the worst lands per acre, not being garden or irrigated

deed, occasion him serious loss. Even the *variations* of so great an element of cost of cotton at Bombay as its carriage from the interior are sufficient to keep down the trade; for, from highest to lowest, within these few years, they have ranged to an extent greater than the whole ordinary cost of freight to England.

What Berar needs, then, is certainty and cheapness of transit; and for want of it that country does not send us one-tenth of the supply it could easily furnish.

Under these very different circumstances, what force can there possibly be in Col. Grant's argument that because Guzerat, with its sea carriage, is pressed by American competition, therefore our supply of cotton from Berar would derive no benefit from a railway?

Nor does the proposed help to Berar in the slightest degree interfere with the relief to Guzerat; but it might possibly happen that to relieve Guzerat without giving a railway to Berar would diminish, instead of increasing, the supply of Indian cotton; since, without extending materially the capabilities of Guzerat, it might give to that province additional safety in yielding to the pressure of American competition, and so create a state of the markets in Bombay which would be incompatible with any supply from the interior.

Without further adverting to a subject I have already discussed at so much length, I proceed to consider the differences of opinion that have arisen as to the local disposition of the improved facilities of transit, which it is agreed on all hands Western India ought to possess. The local disposition I proposed, and which is objected to by Col. Grant, is as fol-

lands, and this was expected to be further reduced; the former rate was about 15s. per acre—a severity of taxation which the practice of our predecessors no doubt occasioned, but could not justify, and which was tolerable only from a considerable amount of tax-free land being commonly held with that which was so heavily burdened.

I observe from the public papers, that an active officer of the Bombay engineers has lately been sent into Guzerat to effect a regular revenue survey; a work which, it is said, has long been delayed for want of competent assistance.

lows:—starting from any eligible terminus at Bombay, I proposed that the line should take nearly the route formerly selected by Mr. Clark as far as Tannah, at which place a bridge over the salt-water tide-way would carry it to the main land; thence it would proceed by the Malsej Ghaut to Alleh, where, bifurcating in consequence of natural difficulties in the direct eastward path, one branch would traverse the Gunguthree and Candeish, so as to approach the chief cotton districts in the Nizam's dominions, and be ready to be extended along the valley of the Nerbudda in one direction, and into Malwa in another; while the other branch from Alleh would proceed with the rivers Goor and Beema, in a s.s.e. direction, to Sholapoor, beyond which point, I believe, little difficulty attends the crossing of the country by railway to the Bay of Bengal. Time and pecuniary means were so limited, that those portions of these lines which lie beyond the Pera River, an affluent of the Godavery, to the north, and Mhusu, near Seeror, to the south, could not be surveyed; but of all between those points and Bombay, plans and sections were taken, and the cost and character of the necessary works ascertained; and of the remainder, extending to Indore, Hoshungabad, and Baitool in one direction, and to Sholapoor in the other, and in length more than 700 miles, ocular examinations were made, which showed that we had no difficulties ahead, and that these lines might be safely and ultimately added to the 200 miles already surveyed. *The whole of these surveyed and examined lines lie in British territory*, a precaution then deemed of indispensable importance, and hardly thought of less weight now. The complete system of railways in Western India of which this line would in time form a part, it was not then thought necessary or proper to discuss. Avowedly for the present, but only for the present, the line omits to pass by Poonah; and this is the defect chiefly for the sake of which Col. Grant would reject it.

The lines proposed by Col. Grant are as follows:—a line of railway to commence either at Bombay, or at Inora Bunder on

the island of Caranja, the latter place being separated from *Bombay* by six miles of sea. *If the line started from Bombay, then it must proceed to Tannah; and, whether from Tannah or from Inora Bunder, Col. Grant proposes that it shall go direct to Poonah by way of the Bhore Ghaut.* Here, as an integral line, he proposes it shall stop, with a prospect, however, of its being extended by Ahmednuggur and Aurungabad, through the Nizam's dominions, to the Adjunta pass. But this line he proposes shall only be made fit to carry light goods and passengers; while the heavy traffic of the country shall be carried on a macadamized road, or a stone tram-way worked by cattle, by the Thul Ghaut, to Bhewndy near the coast, in the general direction of the present route.

The early part of the line scarcely needs discussion, partly because it is already determined on up to Tannah, and partly because a proposal to begin the first great trunk railway, communicating between the vast interior of India and one of its principal ports, with six miles of sea-passage, would not be listened to for a moment, wherever another choice existed. It may serve to show the strength and reasonableness of the latter objection, in the present instance, to remark briefly, that the railway, if of any use to the country it traverses, should bring down an amount of traffic, which in time would require provision for crossing, on an emergency, 1500 tons of goods per day over the harbour;—that if published maps may be relied on, the local circumstances of the shore are not favourable for making the passage independent of the time of the tide;—and that for four months in the year the passage would always be troublesome, and probably often impracticable. I shall attempt to show hereafter that these serious disadvantages at the coast are not attended with any compensating facilities inland.

Col. Grant, indeed, objects to the line starting from Bombay, on the grounds of the expense of the land requisite for approaching the town and harbour, and of the danger of crossing crowded streets, &c., with railway trains. The weight of the first objection may be learned from the Report of the Govern-

ment Committee on Mr. Clark's line, in 1845, in which, between the flats at Bycullah and Warree Bunder, the land (the same in both cases) was valued at less than 10,000*l.*, a sum, I apprehend, singularly small for the accomplishment of such an object; and even if the plan of two termini were adopted, the cost for land to approach them, I believe, would not be more than doubled. The second objection stands for nothing, for no such crossing was ever proposed, or is at all necessary.

Postponing for another chapter the engineering peculiarities of the two lines, as far as they can be separated from other considerations, I purpose now to discuss various other questions raised by the objections of Col. Grant to my line, and by his advocacy of his own.

The chief argument employed by him in support of his line to Poonah is, that when extended from the coast to that place it would be "complete in itself;" and it is asserted, but entirely without proof, that as an integral line it would pay; the accommodation of that city, as the seat of the military and civil government of the Deccan, is much insisted on; and it is affirmed that its being such will contribute much to the prosperity of the railway.

Since, however, no proof of the quantity or sufficiency of the traffic is given or attempted, or even the sources of information in respect of it pointed out, it is necessary to examine the matter with the aid of such facts as we have; and it will be requisite here, as in many other cases connected with Indian railways, to make careful reference to original principles and the actual facts of the case, taking special care neither to disregard the lights afforded by railway proceedings and results in other countries, nor to be misled, in the peculiar circumstances of India, by inapplicable although plausible analogies.

Since the traffic of the country in general, as far as Col. Grant's argument shows anything, may come to either line, it is obvious that the main inquiry, as to the special advantage of the railway passing at first to Poonah, must be in relation to that city. I purpose, then, to ask, first, what is Poonah to the

interests of the railway; and second, what is the railway to the interests of Poonah?

1. *What is Poonah to the interests of the railway?*—No doubt, in England, most of our railways have large towns for their termini;—and for this reason, that with us large towns are seats of manufacture or commerce, to and from which immense weights of material are transported, first in the rude, and afterwards in the wrought condition, or by which maritime traffic is prosecuted on an equally great scale; connected with these transactions is a corresponding concourse and reflux of persons. Following the apparent analogy of England, it seems to have been supposed that Poonah, with 80,000 or 100,000 inhabitants, must necessarily, by the very magnitude of its population, afford sufficient employment for the railway; while the line I proposed, having no great towns for its present inland termini, must as necessarily lack support. That a large town may be, and often is, an eligible and important point for a terminus is not questioned;—but is a large town for a terminus an indispensable condition of success for a railway all over the world? Suppose a well-peopled country, 500 miles long, with a variety of soil and productions in its different parts, but with a dispersed population, and not a town near it of more than 1000 inhabitants; might not a railway advantageously assist in exchanging the products of such a country, although its termini were marked only by its own warehouses and the dwellings of those who worked it? Again, are all large towns necessarily proved, by the very fact of their magnitude, to be occupied by inhabitants who are so employed as to ensure traffic to a railway? I apprehend not; and I think it will be found that Poonah is a case in point.

Until the middle of last century Poonah was little, if at all, distinguished from the *cusbas* (market towns) of its neighbourhood; but, happening to be one of the districts acquired, A.D. 1714, in the confusion of the times, and for his own profit, by Ballajee Wishwanath, the first of the hereditary series

of Peishwas¹, whose interest in that quarter was soon after augmented by the regular grant to him of some neighbouring districts, it became the residence of the family who, in no long period, possessed themselves of the chief power of the Mahratta state. But it appears not to have been before the year 1750, in the time of Ballajee Bajee Rao, the third of the hereditary Peishwas, that Poonah became practically the capital of the empire². The undoubted supremacy at that time acquired by the Peishwa (in form and origin only the first minister of the Raja), and the consequent resort to Poonah of the various great officers and feudatories of the state, with their numerous bands of armed followers, gave an importance to the place which it had never acquired from natural advantages or situation.

On the fall of the last Peishwa, in 1817, and the establishment of the British power, the chieftains were pensioned, while the armed multitudes they had supported were partly taken into the regular service of the state, and partly, probably chiefly, remitted to the labours of agriculture. Poonah, in consequence, fell rapidly in population and wealth, remaining, however, the seat of the quieter and less wasteful power of the English Government. The period of its greatest depression seems now to be past, and the population of late years appears to have somewhat increased³. It is the residence of many of the pensioned Mahratta nobles, the resort of the Governor and Council of Bombay during the rains, and the seat of the local administration of the province in which it stands; it is the headquarters of the Bombay army for part of the year, and several thousands of troops, with some important military and civil establishments, are located here.

From this brief statement of the history and condition of Poonah, it will be seen that its case is very different from that of

¹ Grant Duff's History of the Mahrattas, i. 436, 437.

² Grant Duff, ii. 32.

³ An extremely heavy house-tax, imposed by the Peishwa, contributed to the decline of the city, the repeal of which by the British Government has tended to its recovery.

a large town likely to afford, through the business it prosecutes, sufficient occupation for a railway. It is almost entirely a place of consumption, and it lives chiefly on incomes earned elsewhere. Birmingham, Manchester, Liverpool, Sheffield, Bristol, Newcastle, Sunderland, and other large towns of England, have specific natural advantages, from which have resulted corresponding employments; and others, as Oxford, Cambridge, Leicester, Nottingham, &c., have long been, for whatever reason, the seats of important special interests and occupations. These have been such as to require the aid of the railway system, and they have supplied the requisite remuneration for the service. So also Bombay, possessed of one of the finest harbours in the world, on a coast which has few other good ones, is naturally the chief outlet of Western and Central India, and will necessarily be one of the termini and principal seats of the railway system. Wallajahnuggur, one of the proposed termini of the Madras Railway, is an established inland mart of great importance from the quantity of merchandise which is there collected and changes hands. But I have been unable to discover anything done at Poonah, which is not equally well done elsewhere. On the spot I heard of no manufactures but such as were also scattered up and down the whole face of the country; nor did I learn that the neighbouring district was at all remarkable for its natural productions; nor did it appear that any considerable part of the commercial transactions of the interior centre at that city. So also, I find nothing whatever in the exports and imports between Bombay and the small ports of the Concan, which seems to indicate that any important branch of traffic originates at Poonah, or which appears to be particularly destined for use or consumption there.

If these statements be as correct as I believe them to be, the 80,000 or 100,000 inhabitants of Poonah are just the same to the railway, in reference to the traffic to and from the coast, as the same number of persons elsewhere; a conclusion which may assist us, as follows, in forming an approximate estimate

of the traffic that this city, of itself, may afford to a railway, in the present economic state of India.

The inquiries it was my business to institute into the magnitude and courses of the traffic between Bombay and the interior, led me to conclude that the tract of country supplied with salt from points of the coast near Bombay, is not very different from that supplying the general traffic to and from that port. If this be an over estimate at all, I think it is only in reference to the eastern portion, which is but a small part of the whole. Taking the population of that area at 11,000,000, affording a traffic of 180,000¹ tons per annum, a very easy process of proportion would lead us to expect from the 100,000 inhabitants of Poonah a traffic in this direction of but 1636 tons per annum²; and I really do not see what is to effect this conclusion, *as applied to the coast goods' traffic proper to the city*. If this should be to some a startling result, it must be remembered that the whole traffic with the coast, *as it at present exists*, of a part of India as large as England and Wales, must be brought into one channel, to afford a smaller tonnage than that of some second-class English lines; and that the plan of Col. Grant amounts to proposing that we place our main reliance for traffic on only one of its cities.

2. *What is the railway to the interests of Poonah?*—If this city receives from and sends to the coast but 1600, or say 2000, or even 5000 tons of goods per annum, it is clear that a railway in that direction would not be of so great importance to it, but that its utility might be easily overmatched under some other arrangement. Now Poonah is fed, in part, from the prolific districts to its northward, and derives, I believe, but little of its food from the more rugged districts on the west; a railway, therefore, ensuring cheap, rapid, and

¹ Report, Maps, and Papers of the Great Indian Peninsula Railway Company, pages 31, 47.

² Much of the large traffic on the excellent road between Poonah and Panwell originates, I believe, in the country beyond Poonah, and but a very small part of it is the traffic proper of that city itself.

certain communication with the former, would evidently be of far greater value to it than a line passing through the latter, where, too, it has now a very good road (almost the only one of the kind in the country), macadamized and bridged throughout. If the food of an abstemious Hindoo amounts to $1\frac{1}{2}$ lb. of grain per diem (the average is probably nearly double), and the population be 100,000, it follows that the consumption of grain alone in Poonah is nearly 20,000 tons per annum, besides fruits, oils, and a variety of other articles of agricultural produce, amounting to half as much more, for which the districts traversed by the railway above the ghauts, or to which it leads, afford the best sources of supply. If only one-third of these 30,000 tons were brought to Poonah by the cheap and certain carriage of the railway, the gain to the city would be far greater than any which could result to it from direct railway communication with the coast.

This remark, too, should be further extended to the supply of animal food which Col. Grant states¹ is now brought to Bombay from Candeish, and which might be supplied by rail from that province to Poonah, as easily as London is supplied from Leicestershire or Norfolk².

The importance of these considerations, beyond the direct money saving, is forcibly attested by the facts of the famine which afflicted Poonah in 1823, which I have already given³. Those particular facts I need not again discuss; but I may add that there appears, on several occasions, to have been famine about one extremity of the inland, portions of the line proposed by me, while plenty, or at least a less degree of scarcity, prevailed at the other; a fact which, if as well established as I conceive it may be, goes far to prove the value of that part of the line: for by no other means is it probable that

¹ Page 70.

² Firewood for Poonah, I was told, is obtained chiefly from the wooded parts of the Punt Suchew's country. On the Bapdew Ghaut, on the range immediately south of Poonah, I met cow-dung, which was being brought for fuel to the city from the valley of the Neera.

³ Note, page 114.

the great natural obstructions to cattle carriage will be overcome, which prevented Poonah from being fed in 1823 from Candeish, and which now separate districts often in need of each others' superabundance¹.

Neither this state of things nor the interests of Poonah were overlooked in devising the lines of the Great Indian Peninsula Railway Company; accordingly, as soon as it was ascertained that the valleys of the Kookree and the Goor admitted and required that a main railway should pass along them, attention was directed to the means of effecting railway connection with Poonah. This subject is adverted to not only in the instructions under which Mr. Clark explored the line to Sholapoor, but in subsequent papers, some of which, if I recollect aright, were addressed to the Court of Directors. The line suggested, without, however, sufficient information to warrant adherence to it in detail, would have left the main line at or near Neghoj, and is not very different in direction from that part of Col. Grant's line which lies between Poonah and Seroor, and which, at page 110, he says has no particular difficulty. By this means Poonah would have possessed almost from the first a continuous, although circuitous railway communication with Bombay, available at all seasons, and, what is of vastly greater importance, cheap, easy, and *certain* means of transit from districts under our own government, supplying, or capable of supplying, a great part of its articles of daily necessary consumption.

In discussing these questions, attention has commonly been given too exclusively to the traffic to and from the coast, with-

¹ The effect of the transverse ranges of the ghaut country, and particularly of the long range which commences at Hurrychunder, and extends to the high lands of the Deccan, may be to disturb, in some years, the local distribution of the rains of the monsoon, from which disturbance these local variations of scarcity may easily arise. Whatever may be the cause of it, famines in India are nearly always local, although often extremely severe, and they would be easily and effectually got rid of by the establishment of good means of carriage, *available at all seasons of the year*. In no part of India, I believe, would greater difficulties of this kind be obviated than in the ghaut country between the bifurcation of the line at Alleh and the fertile expanse of the Ganguthurree, which is traversed on the route to Candeish.

out considering the amount and courses of the internal traffic of the country. If, indeed, the prosecution of either class of traffic require, in any case, the sacrifice of the other, there can be no doubt that the trade between the interior and the coast should be preferred; since it is from the increase and improvement of its external commercial relations, that the radical amendment of India must begin. But generally the two classes of traffic may be promoted by the same set of lines; not, however, at first, without some sacrifice of directness, to be remedied as increased intercourse may hereafter render prudent the opening of additional lines. And since the internal traffic of India, although miserably small in proportion to the population, is no doubt much larger than that which it maintains with the coast, a railway company could not fail to find its account in a prudent attention to the facts affecting it, and to the means of accommodating it. In the present case, the line from Sholapoor by Alleh to the Gunguthurree and Candeish may be viewed as a great internal line, which also is joined to the coast by the line from Alleh to Bombay; and in this direction (that is, from north to south, and *vice versa*), and not far from this longitude, a traffic does take place, which, although of unascertained amount, and not admitted into the estimates of traffic which I prepared, is known to be considerable, and would doubtless pay well for the aid afforded it by a railway.

Under these circumstances, it is necessary to consider whether a plan which does provide facilities for an important line of internal traffic, has not in that fact a strong claim to preference; and whether, at the cost of some present inconvenience in other respects, so great an additional advantage ought not to be secured. An English parallel may thus be drawn:—suppose Manchester to be fed from Lincoln, and both to wish to communicate with London; would it not be better to construct at first a T line, with the three cities at its extremities, affording complete although circuitous communication between them all, than a V line, which, however direct from

London, to the other cities, should leave the food of Manchester still to be carried by wagon? And would not the successful operation of such a T line soon bring about a more extended and convenient application of the system?

These objects are too often discussed on the latent supposition that what is now done must be final and exclusive. No account is taken of future extensions of the system when the earlier railways shall have so improved the country as that sufficient traffic shall exist to support a more thickly-set and convenient congeries of lines. The hearty prosecution of the plans proposed for the Great Indian Peninsula Railway Company, would probably soon have brought about a much improved state of things. Nor was anything proposed which would interfere with giving to Poonah the best railway accommodation which the face of the country will permit. If the line, without passing Poonah, had been laid so near to that city as to have precluded the making hereafter of another and more convenient one, there might have been some reason for apprehension and complaint. But since the line, as proposed, crosses the ghauts at 40, perhaps 60, miles from the place where a line from the coast to Poonah must cross them, and since the whole system, as at present proposed, confessedly leaves Poonah to be provided hereafter with the full accommodation which the railway system must eventually afford it, there need be little fear of that place suffering any other inconvenience, or even delay, than that which necessarily arises from the circumstances under which the system is first introduced into Western India. The way is left open and untouched for improvements which must embrace Poonah; meanwhile that city is not only served by railway in the best manner the circumstances of the first attempt permit, but it has the advantage on the direct line to the coast of the best common road in Western India—one, indeed, of the very kind which Col. Grant says is good enough for the vastly greater traffic of Candeish, Malwa, and Berar.

However singular, then, it may seem to omit the second city of the Presidency from the first railway proposed, I could not

but conclude that the interests of the Railway Company, and of Poonah itself, required it should be so, since it appeared, on a careful general view of the physical facts and public interests involved, that the direct line from the coast to that city was not that which ought to be first undertaken.

Col. Grant adduces another consideration in favour of his line, the discussion of which may tend to elucidate a principle not unfrequently urged in reference to the *locale* of Indian railways. It is this:—"that as without the liberal aid and assistance of Government the railway could have no existence, care should be taken for the protection of their interests, in so arranging the general direction of the railway as to be of advantage to their large military cantonments, so as to assist in the transit of military stores, and in the transport of troops, for which purpose the lines should pass through as many military stations as possible."¹ I purposely omit in this quotation all which is peculiar to Bombay, in order to consider the general relation in India of the military convenience of the Government to the location of the different lines of railway.

Whenever the commercial interest of the community, and consequently those of the railway company, dictate a locating of the lines coincident with that required by the military convenience of the Government, or nearly so, no necessity arises for the discussion of this question. But it is true that, for a considerable distance, the line I proposed does not touch a military station, it being, notwithstanding, alleged by me that the line was the best, on the whole, and for the present, for the commercial interests of the country. I wish, therefore, to ascertain how and in what degree these two considerations should affect each other; and I shall assume, rather than admit, that in this case, as perhaps in many future ones, the two objects are irreconcilable.

First, then, I object to the tacit assumption that the greatest advantage to the Government of India from the railway system,

¹ Pages 116, 117.

is that which it would derive from increased cheapness and facility of conveyance of troops and stores. The safety and tranquillity of India depend on its intimate economics,—that is, upon the condition of the people,—and on the opinion of the people as to the effects of the proceedings of Government on that condition. This, which is true of all countries, is pre-eminently true of India. We hold in India the unprecedented position of a governing foreign race, taking little or no hold on the soil, and of numbers and physical power contemptible in comparison with those of the people we govern, for we are hardly one in two thousand amongst them. The natives of each successive part of India which has fallen under our rule have been weary of the caprices, uncertainties, oppressions, and cruelties of oriental despotisms; and believing (whether correctly or not) that we should govern them more justly, have seen us assume the rule over them with indifference, and often with positive satisfaction; and it is not far from the truth to say that, however rude the mode of election, they have chosen us to govern them. For, besides the general truth, that scarcely ever was a country successfully invaded and permanently occupied by a merely military force, where the people were not disunited and discontented, we may see in the events which have marked the progress of our Indian empire, sufficient support for this view of the case. Nor would any other supposition account for the fact, that we really hold India by the strength of the natives themselves. We stand, then, in the most responsible position of the chosen conservators of the peace to all the millions of India; and the breaking down of our power would be the letting loose, for a time at least, and perhaps for generations, of all the worst elements of violence and wrong.

If this be so, the first care of the Government, on account both of its own safety and of its duty to the people of India, is to see well to the foundation of its power,—that is, to the economic condition of the people, in so far as it is, or ought to be, or rightly or wrongly may be deemed to be, dependent

on the proceedings of the Government. Everything which affects the popular estimate of the influence of Government on that condition, affects in the same degree the stability of its power; and in comparison with the effect of that estimate, the merely military power of the Government is, I conceive, a trifle;—a trifle, not indeed in relation to single events, local occurrences, or any actual struggle of the day (in which at present it is everything), but in respect of the great current of feelings and affairs, by which all minor events are originated or overruled, and the eventual destinies of Government are determined.

To put this more practically;—an invasion of the north-west frontier of India, by any foreign power, I conceive would be successful or not in the long run (whatever might be the issue of single battles), according to the content or discontent of the people of India, and the probability which, erroneously or not, might appear to them of their profiting by a change of rulers. If they were contented, it would be a mere military struggle, in which the advantages would be greatly on the side of the defenders; if they were discontented, and hoped to benefit by a change, a small military force, I apprehend, would rapidly rally round itself all the indigenous elements of certain success. I speak not now of the content or discontent of native courts or particular classes, superseded in their functions, or deprived of their splendour or superiority by the advent of our rule,—but of that of the great bulk of the people, of the producing and consuming, the enjoying and suffering masses.

In estimating the probability that a state of general discontent may arise, it must be borne in mind that there are portions of India, in which a tolerable degree of quiet and safety has prevailed long enough to leave the present generation without any very lively conception of the preceding condition of turbulence and warfare. In the territories of the Bombay Government, indeed, and in some other parts of India, the older people well remember the violence and disorder of the times of their youth; but in the thickly-populated countries, which are most nearly connected with the other chief seats of our power,

the greater part of a century has passed away since the confusion and insecurity which prevailed under the native governments afforded a contrast with the personal safety realized under the peaceable and regular, though perhaps erroneous, administration of the British power. As the vividness of recollection in respect of past disadvantages declines will the pressure of present grievances come into force, to mould the opinions and feelings of our Indian subjects; and of such grievances, whether by necessity, by mistake, by culpable wrongdoing, or even by mere misapprehension on the part of the governed, has our Government given sufficient reason to complain. If, therefore, matters be left to take their own course, we may look for increasing dissatisfaction, even along with a really improving condition; and if it be wished that the preference of the natives of India for British rule should be kept or augmented, I conceive it is in just the same degree important that British connection should bring to them new, increasing, and obvious advantages.

Now, if I have not greatly misread the condition of India, no one circumstance, by its immediate or remote action, has so deeply and so deplorably affected it, in all former time as well as the present, as the want of the means of internal communication; nor is there any one class of measures which would so greatly change for the better the condition, aims, and hopes of the people of India, in a manner obvious to themselves, as the establishment of railways, derived from British science, applied by British enterprise and skill.

Without, then, in any degree disparaging the many other uses of the railway system to the Government of India, this I deem the chief,—not its direct application to the business of the Government, whether in respect of revenue, judicial or military matters, nor any saving or convenience connected with them,—but the willing conviction it would diffuse amongst the natives of India, that to British connection and supremacy must they attribute all present improvement, and that on it must they rely for future progress. And I shall venture an

opinion, that a railway, even at Cape Comorin, which should, by its own success, contribute to the prosperity of the local population, and insure the eventual spread of the system in India, would, by its consequences, do more in time for the defence of the north-west frontier than the finest fortress that could be made to frown on the line of Alexander's ancient march.

But all these consequences depend on the commercial success of the railway, and not upon its mere convenience to the Government, or to anybody else, except in so far as that convenience contributes to commercial success. If the first lines pay well, lines enough will follow; and, in all probability, a long period of gradual improvement and corresponding contentment in India will be the result. But if, in any degree, the commercial success of the first lines be jeopardized for the sake of military convenience, by so much is risked the whole of the great series of beneficial consequences, of which that commercial success is the indispensable first term. For these reasons I deem it of the utmost importance that, in no case, should military convenience be suffered to dictate, to disadvantage, the location of Indian railways; but that it should be taken, as in England, and, I believe, almost everywhere beside, as an advantage incidentally arising out of the existence of the system.

But even if not permitted to take rank as a primary consideration, it need not be supposed that military convenience would fail to be promoted by lines located on commercial considerations only. It is true that the earliest lines to be made, the rudimentary members of the great eventual system, may not pass close to the existing cantonments; but if a cantonment exist in the vicinity of a large town, it cannot but happen that the wants of the civil community will, in due time, bring the line to its threshold; if it be not so situated, it may be doubted whether the cost to the community, or even to so much of the interests of the community as are deposited in the hands of the Government, would not be less in bringing the cantonment to a good line of railway, than in making a bad

line of railway to reach the cantonment ; for it must be remembered that to work a bad line is a waste in perpetuity.

To apply these general remarks to the case in hand : the line I have proposed, it is true, touches but few of the cantonments of the Bombay Presidency ; but if it be, as I believe it is, the best railway line, for the first, through the country in which those cantonments stand, I conceive it cannot be permitted that its advantages should be sacrificed for the sake of approaching these military stations. But the line, even as proposed, does actually so thread the country as to afford considerable facilities to military movements, and to present every probability of branch lines soon reaching the most important posts : and that I am not singular in my opinion as to the advantage of rendering military arrangements conformable to the tracks taken, for other reasons, by the railway system, may appear from this, that if I am not misinformed it has been considered, by military men of influence and station in the Bombay Presidency, since the line by the Malsej Ghaut was proposed, whether it might not be advisable to establish a cantonment in the valley of the Kokree, and not far from the place of bifurcation of the railway. Certain, however, it is that the neighbouring mountain ranges afford plateaux more likely to be healthy to Europeans than most cantonments are, to say nothing of the advantages afforded by the beautiful expanse from Nan-yungaom to Ootoor, and from Dingora to or beyond Beyla. If this be a fair sample of what may take place elsewhere, military convenience will lose nothing by falling into the track of commerce.

In one at least of the principles from which the foregoing conclusion is derived, and which I have steadily advocated from the beginning, I am glad to find I have the full concurrence of Col. Grant : he says, "The first railways must be constructed so as *to pay* as a commercial speculation,—a truth that cannot be too frequently or too strongly promulgated ; to

do which they must be executed in the most economical manner ; such economy not consisting in what is generally understood by *cheap works*, for every part should be of the *very best* of its kind, but by adopting such a system of general construction and working of the line, as experience has shown to be the most efficient and profitable in the long run." Not less do I agree with the Colonel in his denunciation of expenditure on embellishments, although it is impossible not to smile at his supposition that extravagant outlay of this kind was resorted to by English railway companies as a means of competing with turnpike-roads and stage-coaches. The principle laid down by Col. Grant is not only sound, but in the circumstances of India it is inexpressibly important. To spend as much on ten miles as would carry the line twelve, without a corresponding working advantage, would be to admit practices which, in India, may defeat every effort to realize due profit to the shareholders, or to promote the vast public interests which the successful operation of the system ought to subserve. The line must be a tool, not a picture. He who spends a shilling on decoration before the line is fully assured of success, sins against the life of India.

I now advert to Col. Grant's wish that all parties had consented to begin on "a comprehensive plan." If the spirit of the following paragraph has not directed the course of Indian railway affairs, it is by no fault or negligence of mine. The line, as to the first engagement, was curtailed at my own suggestion, it is true ; but only to avert the entire extinction of the design.

"If," very justly says our author¹, "we are to wait to test the profits of each portion of line as it is completed, much valuable time will be lost, whilst the little feelers now sanctioned neither can nor will afford any criterion by which to judge of what their eventual success would be, if completed from one grand *entrepôt* to another. Why should we suppose

that there is anything so peculiarly inimical to railway transit in India, that whilst they have been successfully introduced into England, America, into the wilds of which they have penetrated, all Europe, Cuba, and the other West India islands, and even in Switzerland, that for the East Indies alone they are inapplicable? and why, therefore, should we hesitate to commence on a comprehensive system of internal communication until the first few miles have been tested, as if locomotive transit was altogether a new and hitherto untried experiment?"

Cordially agreeing with these sentiments (except as to an unimportant word or two), I cannot but regret that any necessity should have arisen for limiting so much the first undertaking; nor would I have proposed, or been a party to it, but for a conviction, first, that from the timidity of English capitalists as to any enterprise in India, and from the timidity of the Government as to the guarantee which seemed requisite to assure them, no other course was open to us; and next, that even the short and disadvantageous section between Bombay and Calcutta, if judiciously constructed and managed, would at least save harmless all parties engaged in it, and would, necessarily, lead to vastly greater undertakings. Nevertheless it remains true that some risk is run of an opposite result; a risk not diminished by the complexity of the scheme of management and control which has been made to result, and perhaps necessarily results, from the granting of the guarantee. For reasons connected with every great interest, both English and Indian, do I regret that so shrinking a course became necessary; and should a crisis come upon Lancashire, from a failure of American cotton, at a time when it can be said that but for the necessity which occasioned this policy tens of thousands of bales might have been brought from Berar, I know not who will have courage enough to assume the blame.

In India in its present state, more than elsewhere, length of line is an important element in the means of success; for the traffic has to be collected from a vast extent of country in pro-

portion to its amount, while the means of collecting and securing it beyond the extremities of the line itself are of the most miserable description. Holding, then, from the beginning, that a line in India, to afford due profits to its proprietors, or even to be a fair test of the applicability of the system, must reach to the sources of traffic, or extend so far towards them as to insure possession of a sufficient amount of it, my especial anxiety, when in India, was directed to the completion, during the single season at our disposal, of the surveys and estimates, to points so far beyond the ghauts, as to render it certain that the main obstacles to transit between Bombay and the interior were overcome; and this anxiety was so participated in by my excellent coadjutors, that very unusual efforts were made by them to accomplish that object. If time and means had allowed, the surveys would have been carried further; want of them alone occasioned us to stay at Mhuse and the Pera River. During the next season the survey of the northern branch was extended twelve miles beyond that river to Tullegnaom. These points lie beyond the boundaries of the rugged country of the ghauts, while, inland from them, the country is much less unfavourable to the miserable native means of carriage, than in that crossed by the surveys, as so far executed. In default of time for further instrumental surveys, the careful examination of the country as far as Sholapoor, executed by Mr. Clark, and that to Indore, Hoshungabad, and Baitool, by Mr. Conybeare, satisfied us that our future extensions would involve no difficulties. This statement, I apprehend, is sufficient to show that want of "comprehensive" views, or lack of effort to realize them, is not to be attributed to the railway company, at least in those days.

While, however, the proceedings taken in India, on the part of the railway company, were thus "comprehensive," the principle adopted by the Government was that of "experiment;" and to this day Indian railways are "experimental lines." Amongst other difficulties of the case, it is to this really needless, but well-intended and not unnatural caution, that India may

chiefly, attribute the fact that a railway is not yet to be found within her borders. The curtailment of the design was an unwilling concession to the hesitation of that Government, to whose munificence Col. Grant attributes the existence of the line, and not a voluntary change of plan; without that concession, probably the Bombay Railway would have been by this time forgotten.

On one point only do I disagree with the paragraph I have quoted, with so much pleasure, above. Its author thinks that a large town is sufficient and essential as a terminus. On the contrary, I must be satisfied as to what the town is before I accept it as one; and I should think in India that a very safe terminus had been secured if the line reached a spot where it would certainly collect the dispersed traffic of that country, whether that spot happened to be a large town or not. A line abolishing all the great difficulties which the ghauts and ghaut districts oppose to the native modes of transit, cheap beyond rivalry in its charges, convenient beyond example or imagination in India in its action, and extending far enough to render it worth while to remove merchandise to it, would certainly obtain all the traffic that existed, whatever might happen to be the town, or no town, about its terminus; provided only that that terminus was readily accessible from the further country, and afforded the requisite supplies for those who resorted to it. For these reasons I believe that even had the line rested at Mhuse and the Pera River it would have been safe and even highly profitable until it could have been extended. But these were accidental and not selected spots, or selected, if at all, only because they were the first convenient spots, easily accessible from the country beyond them, at which to terminate the surveys. Our views extended, as I believe the line will extend, very far beyond them.

"Monopoly" remains to be discussed. Col. Grant complains¹ that "the traffic by both the Bhore and Thul Ghauts

must be *entirely annihilated* if the proposed railway is to pay a dividend." I apprehend that this argument, if good for anything, is good against any railway whatever, and not merely against that by the Malsej Ghaut. Laying aside for the moment the consideration (the *essential* consideration, indeed) of increase or creation of traffic, it is clear that if the railway is to carry anything, it must take just so much from somebody who carries it now; and this it must do whether the line go by the Thul, the Malsej, or the Bhore Ghaut. The line by the Bhore Ghaut is just as open to this objection as that by the Malsej, unless, indeed, the advocates of the former are sanguine enough to suppose that Poonah itself will supply parcels and passengers beyond the present traffic sufficient to make a line pay. Nay, even the proposed tram-road by the Thul Ghaut, if, as Col. Grant suggests¹, "it were conducted by a company," would be under the same censure, the Colonel himself holding out the inducement as follows²:—"And, moreover, the railway company should undoubtedly undertake the Thul Ghaut tram-line, as a component part of their operations, *thus securing to themselves the whole of the traffic from the interior to Bombay*, with the best possible expectations of success, from suiting their lines to the precise purpose for which they are required, whilst at the same time the interests of Government and of all the inhabitants of the country would be best considered." Surely if it be objectionable to "monopolise" the traffic, or for one party "to secure to themselves the whole of the traffic," it matters nothing whether it be done by the Malsej Ghaut or the Thul Ghaut, by railway or tramway, by bullock, by cart, or by steam; and Col. Grant's recommendation, if his argument itself were sound, might be quoted full in favour of the Malsej.

At the bottom of all this lies, it seems to me, an error. It is assumed that the railway will merely work the traffic which now exists, and that therefore what it may acquire must be

¹ Page 141.

² Page 101; the words in italics are not so distinguished in the original.

taken from somebody who now has it. This is no more correct than it was, in the early days of English railways, to suppose, as most supposed, that enormous numbers of horses would be dispensed with. But horses are probably as numerous, and certainly are quite as dear in England now, as in the days before railways: and, what is more remarkable, there are probably as many employed in public vehicles; there is not even a proportionate falling off in stage-coaches. The miles run, as deduced approximatively from the duty paid under the successive stage-coach acts, were as follows¹:—

		Millions of miles run.
In 1836, the largest amount ever collected, and none of the great railways but the Liverpool and Manchester being opened		about 48
1839	„	40
1842	„	43
1844	„	37
1847	„	35
1848	„	31½
1849	„	30

If we could add to these the many flies and cabs not paying stage-coach duty, now in public use in large towns, in many of which no such vehicles were employed before the establishment of railways, and in the rest of which the number is very much increased, we should probably find that the number of horses actually employed in public travelling is as great as ever. In London the number of hackney carriages, which ten years ago was not 1800, is now little less than 3000.

Meanwhile railways have reached an extent of above 4700 miles. The travelling done by railway is, then, for the most part, a clear addition to the travelling formerly done in England, and not a mere substitution of one mode of travelling for another. Had railways remained exclusively great trunk lines, as their own interest required, and as they will long be in India, it is

¹ From information given to me by the officers of the Stage-Coach Duties Department of the Board of Inland Revenue.

doubtful whether even stage-coach travelling would have been permanently diminished in any considerable degree.

Whoever, indeed, has seen the crowded platforms of the great London and provincial termini, the enormous ordinary trains, the still greater excursion, holiday, even international trains—whoever has felt the convenience of railway travelling to himself, and has witnessed the alacrity with which the feeblest and sickliest, the idlest, the strongest, and the busiest betake themselves to the line, will not require returns and calculations to convince him; he will not hesitate to believe that railway travelling is in fact a creation,—the supply of a social want, altogether beyond the power of the old modes of locomotion, not merely to supply, but even to show that it existed.

Not only is this the result with respect to passengers, it is quite as striking in relation to the conveyance of merchandise. The world where railways exist is full of instances—one may suffice. The promoters of the London and Birmingham Railway calculated, in 1832, that 48,792 tons of goods, then annually passing by road and canal (of which 41,860 were by canal), would be carried by that line¹; one of their agents, indeed, seems to have estimated the total transit of “general goods,” at 143,342 tons per annum (122,428 by canal²), of which larger amount, however, the promoters seem not to have availed themselves in their representations. But in a book which has been read by everybody, and the statements of which are evidently drawn from official sources,—I mean “Stokers and Pokers,”—it is said that only one of the two firms which act as goods’ agents for this company, collected and delivered 273,336 tons of goods in one year, while the Grand Junction Canal, which was to have been ruined by the railway, had carried 50 per cent. more goods than it had ever done before railways existed. When, therefore, Col. Grant says³, that “the

¹ Evidence before the Committee of the House of Lords, page 179.

² Evidence before the Committee of the House of Lords, pages 156 and 55.

³ Page 94.

very existence of the railway, as now arranged, depends upon securing the whole of the traffic that now passes down the Thul Ghaut," his words bear no other meaning than that by which the existence of the London and Birmingham Railway was said to depend on its obtaining the traffic of the Grand Junction Canal; and the upshot is, not only that the railway gets many times more traffic than ever existed before, but that the canal itself carries three tons where formerly it carried but two. Nor is it improbable that more persons are now employed in the various arts of locomotion in some single counties of England than in the whole of England sixty, or perhaps even thirty, years ago¹.

The principles on which these immense results depend, apply just as much to India as England, and are, in fact, likely to exhibit effects still more startling there than here. The opening of common roads in India, in the few cases in which such a measure has been accomplished, has acted just as the opening of the railways has acted here. Two instances may suffice. In the Peishwa's time, and during some years of our own, the traffic of the Bhore Ghaut, that in fact between Poonah and Panwell, or Bombay, was carried on by means of bullocks and ponies, at, I believe, about double the present charge for carriage. Of the nature of the path when a mere customary track, probably without any art or labour bestowed on it, some idea may be formed from that of the present made road; this rises about 1600 feet in three miles, has in that distance 40 well-defined turns, besides curvatures of the line, and has in places gradients

¹ A question may be asked here;—"If you expect to create a new traffic, why do you found your estimates on the old?" Just because here, as elsewhere, there is no other available measure of the traffic the country can produce. This measure is a very imperfect one, and to use it, only amounts to showing that this quantity of traffic, at least, may be relied on, if the new means will carry it better and more cheaply than the old. But this by no means excludes the supposition that the traffic hereafter will be so increased, by the very action of the railway, as to supply abundant employment for both old means and new. It was in order to be unusually moderate and perfectly safe in my estimates, that I did not add anything to the existing traffic, as has been done in almost all other cases.

of extreme severity. The road thus described is a vast improvement on the old track, and was opened in March, 1831; its traffic (aided, no doubt, by the abolition of the transit dues in 1837, and by the extension of the road each way from the ghaut), has risen from almost nothing to the amount at which Col. Grant now states it, of 40,000 tons per annum. I believe it would be found, on inquiry, that, in a considerable degree, this is not a mere diversion of traffic—a transference of it from other routes—but an absolute creation of it,—and that the other routes are pretty nearly as much frequented as before. So also in the often-quoted instance of the road from Bellary to Sirsee on the way to the port of Comptah, the trade of the port rose in the three years which followed the opening of the road from 160,000*l.* to 400,000*l.*, and the 'customs' duties from 4622*l.* to 18,015*l.*; and that this also was a creation, and not a transference, of traffic is satisfactorily shown by the fact that, while the quantity of cotton sent away from Bellary and Cuddapah in 1839, the year of the opening of the road, reached but to 80,000 lbs., it had become in 1842 no less than 6,821,500 lbs., no other favouring circumstance, that I am aware of, having occurred in the interval beside the opening of this road.

If changes like those just reviewed have been effected by railways in England, where everything connected with locomotion had been previously worked up to the utmost perfection its kind allowed, and in India, where even common roads, and those often not of the best, have come to aid the rude uncared-for means of transport which have been the only possession of the people for ages, what may we not reasonably anticipate in India from the operation of railways? provided, indeed, only that we make them where there is traffic enough to ensure their first success. We cannot conclude otherwise than that, in India, where everything has so languished for want of means of transit, and will evidently feel so beneficial a change from the acquisition of them, a railway will vastly add to the actual intercourse,

and will by no means supersede the native labour now employed in carriage.

It is true the direction of that labour may be changed. Our English stage-coaches, instead of being, when in the very pride of their excellence, the insufficient means of transit on our chief roads, are now merely the supplemental means of accomplishing journeys effected in the main by railways; they are branch and extension carriages; and in that subordinate capacity they run over no inconsiderable part of the number of miles they did when employed in the principal part which, it now appears, they so inadequately played. And if we have fewer coachmen, post-boys, and horse-keepers, which, however, may be doubted, we have multitudes of mechanics, engine-drivers, guards, porters, &c., &c., besides the office establishments which so vast a system requires. So also in India, the labour employed in locomotion may have to change its character and direction. The bullock and its driver may have to oscillate frequently on a short road between their home and a railway station, instead of making but once a long and principal journey; branch roads will require that the bullock become accustomed to the cart; the brinjarry may never see the coast or even the Concan, but he may have much more to do in the ~~more~~ congenial climate of the countries where his cattle had their wild jungle birth-place; many a man who might have followed the drowsy march of the pack bullock or pony, will find his employment in the warehouse or workshop, or on the rapid train. All these things, and more, may take place; and Hindoos, whatever may be said of their immobility, have shown to those who have watched them, readiness of adaptation enough to render it quite certain they will not be far behind in the change: but as to any such supersession, or "monopoly," as is implied in Col. Grant's argument, experience must sadly fail us if it ever occur in India.

Yet it must be granted that the error of Col. Grant is no unnatural or uncommon one; and although the few facts I

have adduced, known as they are to all the world, suffice, without many more which might be added to show that it is an error, it is not without an effort of the reason that even persons of general information and reflective habits get quit of it, except they happen to have been familiar with such subjects. These, however, would quietly wait the issue; but it is not without importance to reflect, that the labouring multitudes in all countries have been peculiarly susceptible to suggestions as to the effect of improvements on their means of subsistence; and however groundless the apprehensions excited in them have been found, in the long run, to turn out, it must not be forgotten that the temporary frenzy of men who supposed they were being robbed of their bread, has brought on Governments the most embarrassing duties, and has required, on all hands, the most cautious and considerate treatment; and I cannot but hope that those who, like my respected opponent, have frequent and influential intercourse with the natives of India, will endeavour to bring before them views founded on European experience and general principles, which may justly quiet the apprehensions that unfounded anticipations of monopoly might easily lead them to indulge.

If anything were wanting to give additional force to these general considerations, it would be found in the local circumstances of the case. The growth of the railway system in India, be it ever so rapid, cannot for many years much affect the gross amount of labour required even in means of transit of the present kind. Railways there will still leave unthreaded great tracts of country, from and across which slower means of carriage, that by brinjarry bullocks included, must still convey the commerce of the country; and if brinjarries themselves are ever superseded in India, it will be by the slow agency of remote causes, operating as much with their own concurrence and on themselves, as on the circumstances in which they are placed. And as to anything to be done at present, in respect of the lines more directly under review, it is obvious that while the railways, if judiciously laid out, will only supersede brinjar-

ries in that very part of the general line of conveyance which most hinders the development of the resources of the country, they are more likely to increase the demand for that species of conveyance, by improving the condition of the interior, than to diminish it, by doing part of the work.

Col. Grant's apprehension, however, may perhaps be that the existing *roads*, rather than, the *persons* at present employed, will be superseded. But even if so, what will there be to regret? Who, not immediately interested, laments the comparative desertion of some of the beautiful roads we have in England? The general gain by railways, even setting off against it the loss of these roads, is enormous, and precludes all argument. Surely India is not to be bound to the use of an inferior means of transit, when it would be an immense benefit to adopt a better, even if the old one were wholly thrown away.

But the case of the Bhore and Thul Ghaut roads is not even that of the abandoned turnpike roads of England. The English roads traversed a country already improved almost to the utmost; and they were superseded by railways, running often close alongside them, that took away the passenger traffic for the sake of which they had long principally existed. But the ~~Thul~~ and Bhore Ghaut roads cross the ghauts at 40 miles on each side of the railway, and still further diverge from it, and from each other; while they traverse districts capable of being brought by improvement to supply all the traffic these roads will require, and some, indeed, which, fertile though they be, have yet to be reclaimed from absolute wildness. These lines, then, with ample sources of traffic within their own districts, have everything to gain from the future progress of the country; and I shall venture an opinion, that in a very few years after the completion of the railway for 200 miles continuous from Bombay, if it be carried by way of the Malsej, those roads will have double the traffic which has ever yet been seen on them.

But another view of the "monopoly" entertained by Col. Grant may be that it leaves but one mode and channel of con-

veyance to the people of the country, and (page 101), he calls it "insisting upon their paying three times as much as they need do for the transport of their produce." I am not aware however that it has ever been proposed or wished, that any other existing line or mode of conveyance should be stopped up, or injured, or interfered with in any way; for myself, I never proposed and never could have listened to such injustice; and if all other modes of conveyance be free, where is the monopoly? Every man, in future, would have his choice of all former means of transit, and the railway beside. Who will hinder him from doing the best he can for himself?

If it be said that the railway acts as a monopoly, by practically setting aside all other modes of carriage, it may be asked, how does it effect this? — merely by serving everybody who employs it so much better than he can be served elsewhere, that the universal interest abandons the old methods. It is the same process, and no other, as that by which a superior surgeon, or watchmaker, or merchant, goes ahead of his competitors; and it is of a nature to be carried no further than it is profitable to all that it should be carried. Often as it has "frighted the isle from its propriety" the word "monopoly," so long as no law or force interferes with competitors, has really no worse aspect than this. While men are free to use what they will, the monopoly of a railway, if it must be so called, is only the voluntary preference of excellence; and it is accompanied with no other inconveniences than those which attend the preference of individual excellence in all other cases. Even a single watchmaker or printer, when he had driven all others away, might become dear, negligent, and saucy. It is attended too with the same remedies; for, at worst, whenever the excellence sinks below the old standard, the old methods will revive, probably with great improvements, the old competitors will return, probably with greatly-increased skill.

The argument, in this view of it, is no other than that which might have been employed in England, in the days of pack-horses. During the last century the extension of the turnpike-

road system, and afterwards, in the latter part of it, the rise and progress of the canal system, afforded the means of establishing a monopoly as against pack-horses first, and then of other kinds of conveyance, each successively against its predecessor. But in what condition should we now have been had we defended the pack-horse against the broad-wheeled wagon, the broad-wheeled wagon against the canal boat, and the canal boat against the fly-wagon; or, to follow another series, the saddle-horse (then kept in numbers for hire) against the post-chaise, the post-chaise against the stage-coach, the stage-coach against the steam-boat,—and the pack-horse, saddle-horse, wagon, canal-boat, fly-wagon, post-chaise, stage-coach, and steam-boat, all against the railway? Yet this is the policy to which the allegation of monopoly would have committed England, and to the like of which it would commit India. Not, indeed, that this is an unusual error; long habitude to systems, and to sets of circumstances, induces not only a dislike of change, but a belief in the impossibility of change for the better. It is not yet forgotten that Telford, the greatest road engineer England has produced, set himself, to his dying day, against railways.

The facts, however, warrant our putting the matter on another ground. The greatest profit of a railway is to be made by charges not dependent on the competition of other modes of carriage; that is,—even in the absence of all rivalry its true interest lies in low charges. What is the present result of English experience?—All the lines are looking for recovery to a course of policy in which low fares, in some form or other, are an element. To raise prices to the old stage-coach fares would be unanimously voted madness, and yet the rival coaches disappeared long ago. To keep down railway charges, then, does not require the presence of competition; nor, when railway interests are rightly understood, is the interest of the country in any degree endangered by that singleness of service which is very often confounded with monopoly.

Col. Grant's mention of "three times as much as needful

for the transport of produce" (page 101), appears to be founded on his *estimated* charge of 1*d.* per ton per mile by bullock carriage on a tram-road (page 142), compared with 2½*d.* per ton per mile by railway, as proposed by me for a beginning; it seems, therefore, not unlikely that one view he entertains of the "monopoly" is this:—that when so great an amount of capital had been expended to provide a line of road on which the charge would be 2½*d.* per ton per mile, there would be no probability of the line he advocates being made, on which the charge, he says, might be no more than 1*d.*

But if so great an advantage to the Indian public is to be derived from the use of cattle tramways, instead of steam railways, and consequently so great a margin for profit exist between the practicable charges on one and on the other, what is to prevent other parties laying down the tramway afterwards and under-bidding the railway? All the Government has now to do is to take care it does not tie up its own hands from consenting to such a scheme, and it can hardly be doubted that a profit of 24, or even of 12 per cent., as promised by Col. Grant, from a cattle tramway, would attract an ample subscription of even Indian capital, when once the success of a railway had shown wealthy natives how such a concern could be managed. In this state of things (if we believe in its possibility), or even in the apprehension that such a ~~state of things~~ might arise, what becomes of the fear of "monopoly?"

Obviously, however, this comparison requires that soundness of the plans and estimates for the proposed tramway be established; for the doing of which we have not the guidance of trustworthy examples. The comparison between the railway and tramway rests, I believe, on grounds fallacious on both sides. Postponing for another chapter a more particular discussion of the subject in that view, we need now but little more than the proverbial untrustiness of estimates, to render us cautious in admitting that a large profit can be made out of a cattle tram-road at 1*d.* per ton per mile; and as to the proposed charge by railway, I have already stated that it was put forward,

not as a necessary or permanent charge, but merely as a safe one to begin with, to be continued only until experience should show how it could be safely and properly lowered¹. For anything, therefore, which yet appears, to lose the tramway might be no loss at all; and the “producers and traders” might, and, I believe, would, have in the railway the very best and cheapest mode of conveyance: they might, consequently, have no injustice, nor even disadvantage, to complain of; or if they, or their countrymen, or their Government, thought they had, the remedy,—viz., the setting up of a tramway,—would be in their own hands.

A “monopoly” of *railway* transit, within certain districts, on the principle of a temporary patent right, might, indeed, have been justly claimed by, and conceded to, the first adventurers in Indian railways,—to those who by labour, patience, and cost, overcame the initial difficulties of establishing the system. Since, however, the shareholders in the existing lines virtually renounced that right when they insisted on a Government guarantee, and have not prosecuted their undertakings with such dispatch as to continue to render their private consistent with general rights, the principles on which such a monopoly would rest scarcely seem any longer to admit of discussion in relation to existing enterprises.

¹ The London and Birmingham Parliamentary Estimates of 1832 proposed a rate of 2*l.* 6*s.* 8*d.* per ton for goods between London and Birmingham, 112 miles, equal to 5*d.* per ton per mile. Large quantities of general goods are now carried for much less than half that charge, and coals for less than 1*d.*

CHAPTER VII.

ENGINEERING CONSIDERATIONS AFFECTING THE LINES BY THE BHORE, THUL, AND MALSEJ GHATS RESPECTIVELY.

I PROCEED now to consider the engineering features of the contrasted lines.

Starting from Bombay, the line proposed for the Great Indian Peninsula Railway Company proceeds northward, by Sion, to Tannah, the first practicable point for crossing, by a bridge, to the main land. Uninterrupted railway transit from the insular site of the Presidency and great commercial city of Bombay, to the interior, at all times of the year, is thus obtained.

On the other hand, Col. Grant proposes, as others have done, to cross the harbour, six miles wide, by steam vessels, and to start inland from Inora Bunder, on the island of ~~Oran~~ Oranja.

Although the line by Tannah is already determined upon, and has become the subject of a contract between the Government and the railway company, and although such a route is little likely to be abandoned for one which has six miles of sea passage to begin with, a few observations on this part of the matter may not be without utility. It must be remembered that the chief advantage claimed for this route is its convenience for the particular city of Poonah. A line starting from the coast at Tannah would be at least as advantageous to the country in general as one starting from Inora Bunder, probably more so, but not, perhaps, so convenient for that city as this might be but for the sea passage. During some months of

the year the line by Tannah would probably be universally preferred, even for the use of the Deccan metropolis.

Those great advantages of the railway system, its punctuality and certainty, will no doubt, in time, be as highly appreciated, and as rigorously required, in India as in England. But the passage of the harbour of Bombay, which, for four months of the year, must be across the direction of the south-west monsoon, and in a swell remarkable for its weight, is not likely to be made punctually, nor, indeed, is it probable that it can always be made at all. Small, indeed, should be the choice, or great the countervailing advantages, when such a route is chosen for the first main railway of the country, after all the experience, in England, of the effects of such breaks in the line, and when, in all probability, the worst of those effects, from the frequent violence of the monsoon, would here be far exceeded.

This great drawback to the advantages due from the adoption of the railway system, occurs on a line which opens to the coast a country containing 10,000,000 or 11,000,000 inhabitants. Justice, indeed, to Col. Grant's argument requires that I do not insist on this consideration, for he evidently reckons on the bulk of the heavy produce of the interior being conveyed by the Thul Ghaut to Bhewndy, and thence by water carriage to Bombay. But as I believe that the first railway into the interior, whatever be its imperfections, will bring down large quantities of goods, and ought to be planned with the view of accommodating a constantly-increasing traffic, I may not improperly remark, that as the general traffic between Bombay and the interior (exclusive of salt, which would not cross the harbour) is *now* not less than 100,000 tons per annum, it would not be safe to consider such a line as liable for less, in time, than the occasional passage across the harbour of 1500 tons per day; and this work would be restricted, it seems to me, to certain favourable hours of tide. The two termini, (one on each side the harbour,) the large vessels, the cost of shipping and unloading, and the other complicated and ex-

pensive arrangements connected with such a plan, are disadvantages requiring great compensating circumstances for their justification, which here do not exist.

Since, however, the preference for the line by the Bhore Ghaut is not made dependent on adoption of the harbour passage, I proceed to the next great feature of that line, the ascent of the ghaut. The difficulty connected with this subject, Col. Grant proposes, as others have done, to evade, by omitting, for the present, to effect the ascent by railway at all, and leaving the work to be done by carts. The prudence of this proposal seems extremely doubtful, and it could not but be regretted that so very necessary a work should be postponed from the fear of undertaking it. The best interests of the railway company, no less than those of the country, would scarcely fail to suffer from such a step.

If on a development of the traffic which, with any line, may reasonably be anticipated, a transit of sometimes 1500 tons per day (750 tons in each direction) were to be provided for, and the bullocks and carts were supposed each to make, on an average, an ascent in one day and a descent on the next, nearly 12,000 bullocks, and half as many drivers and labourers, must be permanently congregated on the spot, to the imminent risk of epidemics breaking out amongst them;—an extra cost for loading and unloading the carts must be incurred, equal, probably, to the charge to the public of twenty, or of the cost to the company of forty miles, railway conveyance;—a delay of one day, and perhaps of more, must take place in the transit;—and the passage of several thousands of carts every day, over a road swept, during four months of the year, by the rains of the ghauts, would probably render it impossible to keep it in repair, unless it were constructed at a cost not very dissimilar to that of a railway. If to this, too, we add the greater cost of working such an incline by bullocks than by steam power¹, and

¹ If we take the load of a cart, with two bullocks, to be one-third of a ton (which, in such an ascent as the Bhore Ghaut, is certainly a large allowance), and adopt Col. Grant's estimate (page 141), that two bullocks, with their driver and a

the probability that every year these evils would be increased by the increase which ought to take place in the traffic, we shall probably be convinced that such a mode of dealing with the matter would soon become, as it should at first be deemed, intolerable.

It would surely be a remarkable and not very creditable feature in any such undertaking, if the application of its most striking and important means of superiority should be expressly avoided, where there is the best opportunity and the most need for it. If inanimate power is so superior to that of living animals on a level as to have driven the latter from the competition, we may safely infer that it would be found still more superior where the severity of the labour is notoriously and proverbially destructive to the cattle employed:—the ghaut country is most of all dreaded by the brinjarries, and is far more fatal to their cattle than all the rest of their journeys. And if inanimate power have so great an advantage in temperate climates, well suited to the growth, strength, and endurance of the animal frame, what may we not expect from the contrast, where, itself undiminished, it has to compete with the lax and diminutive cattle of a tropical country? Precisely in these circumstances, where most of all we might expect to

cart, can be maintained for 172·23 rupees per annum, we shall find that for bullocks to pass up and down the ghauts 150 times per annum, always loaded, will cost at the rate of 3s. 3½d. per ton on the average of the two journeys. If, on the other hand, as I purpose to show, steam, ^{per} draft, when the friction is 9 lbs. per ton, will cost in India 0·483d. per ton per mile (indeed, this includes the cost of working ordinary gradients also, which I here omit to deduct),—and if on this basis we calculate the cost of ascending the Bhoze Ghaut as an incline of one in ten for three miles, we shall find the expense amount to 3s. 1½d. for the up-journey, to which is to be added little more than 1d. for that in the other direction,—the average being not more than half the cost by bullocks, to say nothing of the cost of twice removing the loads. The practical reader will see that in this rough comparative calculation, considerable allowances have been omitted, which would have diminished the cost of steam; and I may add that while, to some extent, and in some circumstances, it is true that a descent compensates for an ascent, in respect to inanimate machinery, it can rarely, if ever, operate so in respect of animals employed in draft, whether as to current maintenance, or wear and tear of life.

realize the immense comparative advantages of inanimate power, it is proposed to forego them entirely, and to leave the ghaut ascent without them.

Even, however, if a step so beset with disadvantages were adopted for a time, it would still be necessary to ascertain that the line was so devised as to admit of being ultimately completed as a railway. The passage of the ghauts is, therefore, an essential element of the earliest plans.

Believing, however, that the discouragements which attend imperfect information should not and will not, in the present state of the question, prevent the serious and hopeful consideration of this subject, I proceed to state the facts, and the course of investigation, which led to the selection of the line eventually proposed. The further discussion of the engineering features of the Bhore Ghaut route will be better taken in connection with that of the Malsej line.

The Syadree range, better known as the Great Western Ghauts, runs north and south, at distances varying from thirty to sixty miles from the western coast of India. Its principal characteristic is that of being a sudden step in the general level of the country. The eastern side of this step is higher by 1500 or 2000 feet than the western. No corresponding declivity occurs to the eastward; but the country gradually declines from its elevation of from 2000 to 3000 feet above ~~the sea~~, on the crest of the step, to the shore of the Bay of Bengal, 700 miles distant. This step must be passed by all traffic between Bombay and the interior; and one consideration in choosing a railway line across it is, the amount of mechanical power to be expended in raising the in-going traffic to this elevation, with the best means of expending and applying that power.

This singular and enormous disturbance of the general level is accompanied by other physical peculiarities, which are rugged and difficult in a proportionate degree. The table land above is covered with ranges, often of more than 1000 feet in height, running eastward or south-eastward from the crest of the step; their feet often choke up the narrow valleys between their pre-

cipitous sides. The low country, to the westward, bears immense mountain blocks and some ranges, while smaller hills, encumbered with jungle, and taking almost every direction, break up the surface into intricacies of every kind. The great step itself, perpendicularly sudden in many parts, is practicable for men by difficult paths, stairs, and almost ladders, in some places; and for cattle by the fewer wild and crooked tracks, which nature has permitted native use to trace. On the brink of the step stand vast mountain masses, from each of which starts one of the transverse ranges of the table land; and a rocky ridge, some hundreds of feet in height, stretching from mass to mass, commonly closes the head of each valley, becoming a hill to the eastward, while it augments the height of the fall towards the west. Through this country, which extends with diminishing features for thirty miles on each side of the great step, does all the traffic of the interior pass to and from Bombay; and quite through it must the railway pass before its benefits will be fully realized. The problem is to choose the best path through these intricacies, due regard being had, at the same time, to the accommodation of the different districts of the country, and the prospect of a remunerative traffic.

The earliest considerations of this subject in India had been governed by the idea that the actual ascent of the step was the great difficulty, and that consequently the first search should be for a spot at which, from the formation of the ground, that difficulty would be the smallest. The actual examination of the line of the ghauts, which this mode of proceeding would have required, was estimated to occupy two years, a prospect which led to the postponement of the effort, and, accordingly, Mr. Clark's plan proposed no means for the ascent of the ghauts.

It occurred to me, however, that the real difficulties would probably be found, not so much in the ghaut itself as in the connected valleys. For the lifting of any traffic to the same elevation would require (with some variation from circumstances) but the same amount of mechanical power, which might indeed be more or less conveniently or agreeably applied

according to the nature of the ascent, but as far as the country was then known was not likely to involve much greater cost of working the lift at one spot than another; but in such a country some valleys might be so much better than others for the line on the level as to lead at once to a great limitation of the further search for an ascent. The information already collected materially aided the application of this view of the case. For the valleys of the country above the ghauts—the Deccan—were not only sufficiently accessible for speedy examination, but, from some distance south of the Bhore Ghaut, up to the Malsej Ghaut northward, they were already described by Lieut.-Col. Sykes, in a paper on the Geology of the Deccan, published in the “Memoirs of the Geological Society.” Following this guidance, I learned, in England, before I went to India, and contrary to my original expectations, the great probability that the general line of the Malsej Ghaut would prove the most suitable to the purpose. This opinion derived confirmation from a report of Lieut. Stuart, of the Bombay Engineers, who had been directed to survey that line for a road, by which the Calcutta mail should be carried without making the *détour* by Poonah; and from a paper by Mr. Giberne, then Collector of Tannah, on the features, condition, and capabilities of that part of the Concan through which the route would lie. The expectations founded on these authorities, I embodied in a paper which I supplied, at his request, to the editor of the “Railway Register,” in July, 1845, very shortly before I left for India.

On my arrival at Bombay, I found a division of opinion as to the terminus and course of the line. Some persons advocated the route by Tanpah, proposed originally by Mr. Clark, and since adopted; while others preferred a terminus at Hog Island, on the opposite side of the harbour, and a line generally identical with that now proposed by Capt. Graham, and advocated by Col. Grant. Both parties willingly postponed the decision on my suggestion that it might probably be an inevitable corollary of the more inflexible question of the passage of the ghauts.

My local investigations, which commenced above the ghauts, were preceded by three journeys on the line between Panwell and Poonah. The information given me by officers best acquainted with the country to be examined, and whose duties led them to a minute knowledge of its peculiarities as far north as the Poonah Collectorate extended, went entirely to confirm the views I had provisionally formed in England. As soon, therefore, as the season permitted, I went into the Murra Khora (the valley of the Malsej Ghaut in the upper country), passing some days with Dr Gibson, at his house, a few miles from Jooneere. Here, and on my entrance on the actual field of examination, I had the great advantage of the company and advice of that highly-informed and scientific gentleman, who has long resided in this quarter, and of Mr. J. D. Inverarity (then first Assistant Collector, and in particular charge of these districts), and of Major Liddell, then a magistrate of the Zilla, and Commandant of its Police Corps, whose duties not only rendered him familiar with the country, but had recently carried him, under unusual circumstances, into these very quarters. These highly-favourable opportunities for preliminary inquiry affording nothing but confirmation of previous intelligence, and neither the Committee in Bombay nor myself being supplied with the greater means than would suffice for the effectual examination and survey of one line, I fixed my attention on that route to which all testimony so strongly and concurrently pointed; and finding that the valley, quite to the crest of the ghauts, was altogether as favourable as it had been represented, and the ascent itself, on examination, appearing to me to be at least as practicable as any other was likely to prove, indeed more so than I had hoped for, I ventured to wish that the very valuable aid of Mr. Clark, which had just been engaged by the Bombay Committee, should be applied to the requisite examination of the country from Tannah to the ghaut, including the ascent of the ghaut itself. This design was encouraged by the account given me of the lower country through which Mr. Smith, the Deputy Chairman, and Mr.

Ayrton, the Solicitor of the Company, passed on their way to the Malsej Ghaut, where they visited me; and by the equally-favourable opinion of Mr. Conybeare, who soon after came through the same country to join me. From the head of the ghaut, quite down to Mundroop, at the junction of the Beema and Seena Rivers, the description of the country given long before by Col. Sykes afforded assurance of finding an eligible line, while on other routes it was known that difficulties existed; and, still further, it appeared that down to Sholapoor, and eventually along the line of the Kistna, no difficulty would be experienced in reaching the centre of the Peninsula, where, no doubt, lines from the eastern coast would meet us.

There still remained to be determined the practicability of passing from this line to the northward; and as a lofty range of most precipitous and impracticable character, separating the river systems of the Kistna and Godavery, forms the northern boundary of the Malsej valley, while the country beyond it was little known in detail to the best-informed parties to whom I then had access, I could not but feel some apprehension on the subject; and as I understood that three mountain ranges intervened between the valley of the Kokree, in which the line near Alleh lay, and the level expanse of the Gunguthurree, which it was necessary to reach, I could not but be fearful that, at best, the works would be of a disadvantageous and expensive character. The accession, however, at that time, of Mr. Conybeare to our strength, afforded the means of early examination, and the energy and intelligence of that gentleman soon brought the solution of the difficulty. The first range breaks down at the Alleh Khind, twenty-three miles from the Malsej Ghaut, and there affords the most eligible opening to the north; the second is cut through by the Mool River at Gunjpeer; the third may be tunnelled, as is proposed, at the Amboreh Khind, or may be turned at Nandoor. This part of the line, like all the rest, is of unlooked-for excellence and facility of execution, and no unusual or even heavy works are required.

After the first careful examination was effected, which was for

the most part without instruments, and when the actual survey was arranged for and commenced, I returned to Bombay, spending a short time on my way with Mr. Clark, then at the Malsej Ghaut, who had become fully acquainted with the line across the Concan, and with the details, as then understood, of the ghaut ascent. His representations and reports amply justified the course which had been taken. Soon after my arrival in Bombay, wishing not only to be satisfied that the Malsej line was good, but to be able to judge, if possible, whether it was the best the country afforded, I addressed inquiries by letter to Major Liddell and Dr. Gibson, in respect of the Poonah Collectorate, that is, in respect of the country as far north as the Malsej Ghaut, and to the late Mr. Langford, then collector of Ahmednuggur, as to the country between the Malsej and Thul Ghauts, which was under his charge, and which he had long known. The answers, the material parts of which are embodied in a document given at length in the Appendix, supplied all proof still wanting that the best line had been selected, and, combined with the more regular observations of Col. Sykes, and a few particulars from other quarters, afforded a complete and tolerably sufficient view of the very marked engineering characteristics of the country to the eastward of the ghauts, and extending in latitude from the Bhore to the Thul Ghauts inclusive. In this state our engineering knowledge of the ghaut country remained until I left for England, except that the instrumental surveys, required for estimates, fully bore out the opinions derived from the preliminary examinations.

Very soon after my arrival in London I was placed, by the London Board, in communication with Mr. R. Stephenson, Consulting Engineer to the Company, and all my papers were submitted to his examination for report. That eminent engineer was "struck with the circumstance that, in the vicinity of the Malsej Ghaut, several streams seemed to radiate from it in different directions, as from a focus, which led him to suspect that the lowest ghaut had not been selected for passing this range of mountains." He accordingly called for information: the result

of that supplied to him, viz., the letter given in the Appendix, led him to "express his conviction that the Malsej Ghaut had been judiciously and properly selected."

Before these proceedings in London were known in Bombay, Mr. Clark was desired by the Committee there, to undertake a personal examination of the ghaut range. Time did not permit this to be effected for more than the district between the Malsej and Bhore (or, perhaps, the Koosoor) Ghauts. The report of that gentleman not only agrees with all former representations, but supplies valuable additional particulars of the ghauts themselves, and very important engineering notices of the surface of the Concan, as far as it affects the present undertaking. This paper is given in the Appendix.

The first survey of the ghaut was made in 1846, and afforded an inclined plane of six miles long, consisting of three straight lines joined by two slight curves, with an average inclination of one in eighteen, of which the most severe portion was one in fifteen. To work this incline, stationary engines, or some special contrivance, would be required. In the following season, however, Mr. Clark effected another examination of the Malsej Ghaut, and of the country immediately connected with it below, and he found, as from former observations he hoped, a line of ascent not so remarkably straight indeed as the former one, but straight enough for the purpose, ~~more~~ than thirteen miles long, and with a nearly uniform rate of one in forty. This line, which has not quite so severe an ascent as the well-known Lickey incline, on the Birmingham and Gloucester Railway, is clearly capable of being worked by locomotives specially adapted to it.

A line was also instrumentally surveyed by Mr. Clark, from the proposed bifurcation at Alleh to Mhuse, a distance in a south-south-east direction of 45 miles, with a result singularly favourable to facility and cheapness of construction: the same line was examined by him, with equally favourable results, quite down to Sholapoor; and I may here repeat that, besides the

¹ Mr. Stephenson's Report, Feb., 1847, Appendix.

survey extending from the Malsej Ghaut, by the Alleh Khind to, and eventually beyond, the Pera, Mr. Conybeare effected an ocular examination of the country through Candeish, Nemaaur, and Goondwanah, as far as Indore, Hoshungabad, and Baitool, by which we were assured of the existence of no difficulties in those directions.

One purpose of these statements is to show that the Malsej line was not adopted hastily, or from mere guess or prejudice; another is to exhibit the sources of the information, and the value of the facts, which led to a result so little anticipated at the beginning of the investigation. The grounds of preference for the Malsej route seemed so decided that the result has never, I believe, been disturbed by any person who knows both routes; and the question of the line to be taken in the vicinity of Bombay, which was left dependent on the passage of the ghauts, was not raised again by any party connected with the investigations, or informed of their details.

Of the engineering character of the lines thus selected, it is perhaps enough to say that, always of course excepting the actual ascent of the ghaut, there is neither curve nor gradient from one end to the other which would prevent as advantageous a working of the traffic as any in England, whether it relate to the economical transport at low speeds of heavy goods, or the transit of passengers and letters at the highest speeds. Nor are these results obtained by any unusual cost, or, indeed, by works of so much as ordinary amount, tunnels even included.

The evidence, then, available for judging of the eligibility of the Malsej line was originally derived from a great variety of concurrent sources—it was collected on the ground with every degree of care which the case admitted,—and it is now embodied in plans, sections, reports, and estimates, in which, I believe, no material fact is overlooked; the reports, indeed, of Messrs. Clark and Conybeare contain the fullest details of the districts traversed, and, I think, cannot fail to produce conviction in respect of all subjects dependent on them. On the other hand, the evidence in respect of the line from Inora Bunder to Poonah,

by the Bhore Ghaut, lies in a report by Capt. W. D. Graham, of the Bombay Engineers, Superintendent of Roads and Tanks, which, I am told, has not reached England, and which, I have some reason to apprehend, but am not certain, is founded not on *instrumental* survey, but on inspection. The expression used by Col. Grant is, that this line has been "surveyed, reported on, and strongly recommended" by the above-mentioned officer. In the absence of that report, I have to rely on detached and incidental notices of the country derived from other sources. So also as to the line of macadamized or tram-road from Bhewndy, by the Thul Ghaut, Col. Grant affords little information in aid of that which I must gather from other authorities. This difference in the character of the evidence adducible on the two sides of the question will, of necessity, make itself felt to some disadvantage in course of the discussion; but notwithstanding this disadvantage, it may be advisable to state such particulars of the engineering details of each line as are available.

Having already considered the two great breaks of continuity on the Poonah line, viz., that at the harbour, and that at the Bhore Ghaut, I need not again enter on that subject. The line starting from Inora Bunder, on a point of the Island of Caranja nearest to Bombay, traverses that island, and then crosses to the main land, over a strait said to be not more difficult than that on the other line at Sion, which, however, is not so much a creek, as a marsh, with a bottom of rock. Then the road is said to "run chiefly up the Apta valley, to the foot of the ghaut, and to present no difficulties whatever to the construction of a railway,—certainly none of the tunnels of the Malsej line."¹ I have already stated the ascent of the ghaut is to be left "for the present to a system of portage," where the ascent is of a length of three miles with an ascent of more than 1500 feet.

The geographical distance of Inora Bunder from Poonah is about $67\frac{1}{2}$ miles. The travelling distance by this line would be

¹ Col. Grant, page 104.

78½ miles, to which is to be added six miles to complete the distance from Bombay, or 84½ miles.

The first question is, whether, when necessity shall arise for it, the Bhore Ghaut mountain can be advantageously ascended by railway, at any point which can be reached by a line from Inora Bunder, or any similar point of the coast; a question which involves the prudence of making any railway at all in this direction.

The mountains here assume in plan the form of a T, or hammer, the shaft of the figure by which it is joined to the mass being very short; or in other words, a mass of mountain, connected with the table land only by a narrow neck or isthmus, runs roughly parallel, and near to, the great step of the ghauts. The shaft, or isthmus, is so short as to give the space between the western precipices of the nearly detached mass, and the eastern one of the main table land, the character of an immense ravine: of these ravines there are two, one to the north, the other to the south of the connecting isthmus; on that isthmus, when its elevation is reached, the present road runs. Mr. Clark's report, given in the Appendix, states that the southern ravine, across the head of which the upper part of the Bhore road is carried, and which is in some respects suited for an inclined plane, is cut off by an impracticable tract of high ground dividing the valley of the Apta from that of the Nagotna River. On the other hand, the same engineer states, that "the ravine north of the Bhore Ghaut, at the head of which stands the village of Kundalla, is no doubt perfectly accessible from Kallian, by the valley of the Oolassa River, though not from Panwell." If this ravine be not accessible from Panwell, then it cannot be from any part of the valley of the Apta. According to this representation, which excludes both the northern and southern ravines, it is only the western face which can be made available for ascent by any line starting from Inora Bunder; neither my own recollection, nor any statement I have met with, would lead me to suppose that this face is fit for such a purpose. It will also be necessary

further to inquire, as I think it will be found, whether any route by the western face would not lead to a point from 100 to 200 feet higher than Kundalla, or the height of the ghaut as already represented, to be lost again in passing that village, and to be regained again in the very unfavourable ground beyond it. Of course these statements, as well as that of Dr. Gibson, given in my letter to Mr. Stephenson, in the Appendix, which is derived from that gentleman's long and intimate official acquaintance with these districts, must be held subject to the results of any instrumental survey, with this express object in view, which may have been made by Capt. Graham, or may be made hereafter.

Of the character of the ground between the sea-side and the Bhore Ghaut, on the line from Inora Bunder, the only information I have would lead me to suppose it difficult and expensive, but practicable.

The line between the ghaut and Poonah must certainly, for some miles next the ghaut, and for some others between the Inderaonee and Powna Rivers, be very expensive, and will afford after all but indifferent gradients, to be worked at a severe current cost.

Since the principal objections to the line beyond Poonah proposed by Col. Grant do not arise from its engineering character, but from other considerations, it is unnecessary to pursue this part of the subject in great detail. I may, however, remark that the scanty materials in my possession would countenance a supposition that the route would be found on instrumental examination less favourable than Col. Grant's recollection, probably only from occasional sight of it, has led him to represent it. Besides some expensive ground between Poonah and Ahmednuggur, which I suspect from the statements of the route books, from Col. Sykes's description of the country, and from one of Mr. Conybeare's reports, it seems likely from Major-General Cullen's barometrical observations, that in the Nizam's dominions the water sheds, which would all be crossed, would be found so elevated above the rivers as, in some places,

to make steep gradients unavoidable, a circumstance which even a practised eye might easily fail to detect. If, indeed, there were any considerable object to be gained by making a line beyond Poonah in this direction, I do not think there are any insuperable physical obstacles; and no doubt some day such a railway or one to the Luckenwarra Ghaut will exist, to public and private profit; but at present, with no special inducement attaching to it, this part of Col. Grant's line is liable to disadvantages (to be pointed out hereafter) too serious, I think, to permit it to be an early undertaking.

The defects of the line above described, as a medium of conveyance for the general traffic of the country, seem to have led Col. Grant to recommend that it should be constructed only as a light railway for light goods and passengers; and that the Thul Ghaut road should be fitted up as a tramway, to be worked by animal power, and extended east and west to the interior and the coast, for the transit of heavy goods. This design seems open to objections of the gravest kind, affecting the interests both of the railway and of the country; confining myself here, however, to engineering considerations, I proceed to describe the country through which this Thul Ghaut line passes.

This route, which touches the coast at Callian, or perhaps at Kusseylee Bunder, near Bhewndy, the present termination of the inland transit of goods from the interior, depends for its connection with Bombay in Col. Grant's plan on the existing water communication. This water carriage is neither so convenient nor so cheap as has been represented, it being available *with dispatch*, if I remember aright, only at certain times of the tide, and with certain winds, and its charges being not much less than those at which coals and stone are carried on English railways.

Of the country between Bhewndy or Callian, and the foot of the ghaut, the following notices will here be sufficient; further details may be found in the Appendix. To Shahpoor, half way across the Concan, the country requires no further remark than that, although not impracticable for a common road, it would

certainly not be chosen for a railway, or for a line to be hereafter converted into one. Beyond that town it is of the most discouraging description in its physical character, and at certain seasons of the year it is particularly unhealthy. It is very thinly inhabited, thickly covered with jungle, and scantily supplied with water. To the north-west of the present road, and particularly beyond the Vyturnee River, little occurs but forests inhabited by half-savage woodcutters, under the rule of native rajahs, practically almost independent of the British Government. To the south-east of the road as far as the ghauts, the country is scarcely less wild in its natural features, but it is under direct British rule. The present roads or tracks afford no favourable indication of the probability of much better being found in their neighbourhood; and if even better be obtained, it seems it must be by taking some entirely new route, the issue of the search for which is yet, I believe, unknown.

As to the ascent of the ghaut itself, I have not complete information; but some probabilities connected with it throw some light also on the physical formation of the Concan in its neighbourhood, and of the districts through which the road must pass. For reasons given in my letter to Mr. Stephenson, in the Appendix, I take the crest of the Thul Ghaut as being probably from 1900 to 2000 feet above the sea. Now Lieut. Chapman, who latterly superintended the construction of the road on the ghaut, stated the height of the actual ascent, from the foot to the top, at 1100 feet; the more recent statement of Col. Grant, applying perhaps to other points, makes it but 933 feet. Taking either of these figures from that of the probable height of the top of the ghaut, and it would appear that the *foot* of the ghaut is not less than 1000 or 1100 feet above the sea; and as this elevation is probably chiefly acquired in the latter or eastern half of the Concan, it appears nearly certain that a line in this direction must encounter extremely severe gradients, from the combined effect of local features on a large scale, with a general and rapid elevation of the country. If any chance of escape from this discouragement presents

itself, it must be by following the tortuous and difficult course of some river—a resource which, as we witnessed in examinations for the Malsej line, is not in the Concan a security against great difficulty and expense.

That the formation of the northern part of the Concan, and particularly its rapid rise to the foot of the ghauts, is not here misstated, follows from other known facts. It is universally said that the actual rise of the top of the ghauts above their feet is there often not more than 500 feet; but the known elevation of some points in the rivers of the Deccan, and the necessary allowance for their fall, leaves it certain that the *crests* of the ghauts here attain an elevation which requires that, with an actual scarp of so small an altitude, the *foot* of the scarp must be of very considerable height above the sea. Combining this consideration with that of the extremely scarred, rugged, and confused character of the surface, it is hardly possible that a line of road in the interior of the Northern Concan should not meet with formidable disadvantages. The character of the country in this respect seems to change about the latitude of the Kaloo River; and to the south of that line the country about the foot of the ghauts has but a small elevation above the sea. The disadvantages which exist there are of a different kind.

Of the *ghaut* ascent itself, it is only needful to say that to obtain a good cart road it has been necessary not only to construct expensive works, but to render the line so circuitous, that its length, I suppose, is not much less than double the direct distance between its extreme points.

Between the ghaut and Nassick, some rough and difficult ground occurs; beyond that town, 29 miles from the ghaut, no further difficulty is presented to the eastward.

The survey for a road, at present, I believe, in progress, will afford more exact information on some of the points I have just discussed than any I have yet met with; and it is to be hoped that it will lead to the effective prosecution of improvements of great local importance, although in all probability it will elicit

no facts which can, in prudence, affect the arrangements for a general system of transit by the Malsej Ghaut, which have been proposed.

The line by the Malsej Ghaut has now to be described in its chief engineering details. The terminus at Bombay may be single or double, as may hereafter appear advisable; but even if made double, so as to reach all the important points of active resort and business, and to be in connection with the harbour as well as the densest seats of population, the cost of it would be far less than has perhaps ever been incurred elsewhere for the same accommodation.

The slightest works suffice on the islands of Bombay and Salsette, except, possibly, in immediate connection with the terminus; for on these islands the substratum of basaltic rock, which is universal on this side of India, is commonly met with at about two feet from the surface. The line crosses from one of these islands to the other, by an embankment at Sion, over a rocky strait now nearly silted up. Running, then, along the singularly flat country on the east side of Salsette, it crosses the tidal strait below Tannah, reaching the continental shore by a bridge, which as originally designed was of considerable magnitude, but had great facilities for economical execution. Immediately afterwards it pierces by a tunnel, or turns at Persick Point, the range which skirts the coast; from this range to Callian no special works occur, a long though low embankment carrying the line over the depressed grounds which intervene.

From Callian, eastward, I follow the description afforded by the reports of the first appointed railway engineers; premising only that the investigations prosecuted by them had, in general, no further responsibility than that of pointing out an eligible and practicable line, without attempting to say that improvements might not still be made, especially in details.

At about 29 miles the line is abreast of Callian; at 32 miles the Waldhur River is twice crossed; at 35 miles the line intersects the Callian and Chowk road or track, at a point about

six miles from the former place, and 25 from the latter. Chowk is on the road from Panwell to Poonah. Immediately afterwards occurs the Marowlee Tunnel, of the length of 4860 feet, and situated 93 feet above the sea; the Oolassa River is there bridged at a height also above the sea of 56 feet. The Chone jungles, which extend nearly seven miles west from the Oolassa, are next traversed; and within them the Bervee River is five times crossed, its tortuous valley affording almost the only means of passing the ranges of hills, running north and south, through which its stream has cut. Within this district, which is a continuation south of the Kaloo River of the still wilder and more difficult country on its northern side, occurs the next tunnel, that of Shelsaith, of 1000 feet in length. Whether any diminution can be effected in the works situated in this district, was left to be determined by further search, the peculiar difficulties of examination, from the thickness of the woods, having left some doubt on the subject. The line as proposed, however, is amply good in quality for all purposes; and alteration can hardly have other reference than to expense, or convenience of execution. Moorbar, at 50 miles from Bombay, is passed at a little distance to the south of the line, near the points where the Bervee is again twice crossed. Immediately afterwards occurs the point at Nudvee, where choice must be made of the route for ascending the ghaut.

In the first year's examination, that of 1846, it was judged best to reach, as soon as practicable, the valley of the Kaloo, the river which rises at the Malsej Ghaut. The lower course of this river is in a difficult or impracticable valley; and only when so easterly a point as Nudvee was reached, did it appear likely that the proper river of the selected ghaut would afford any facilities to the progress of the line. At that place the line turned north, and entered the valley of the Kaloo, through two tunnels at Kholetun, of the lengths of 3640 feet and 620 feet respectively. Crossing then four small streams, the Doyefodee, the Heerā, the Kaloo in its upper course, and the Zooloondie, the line requires a tunnel of 3100 feet at Sasowlee,

and, after two more crossings of the Kaloo, a shorter one at Maroosee of 500 feet, arriving immediately afterwards at the final bridge over the Kaloo, which marks the foot of the incline. The last-mentioned point is 77 miles from Bombay, and is 291 feet above high-water mark. No gradient has yet been encountered more severe than 1 in 330, nor any curve objectionable even for the highest speeds of railway travelling. The works, numerous as they appear, are comparatively light, and, of their kinds, inexpensive. The bridges are over rivers with rocky beds and banks, and dry, where crossed, for several months in the year; the earthworks are below the average of English lines, and the tunnels would, to a certainty, be mere dry excavations without linings, and, very probably, without lining.

The ghaut ascent itself, which is of the length of 30,960 feet, rises 1770 feet, from the bridge at its foot, to its highest point on the table land. The three straight lines of which it is composed (it might almost be said to be *one* straight line), passes seven tunnels and two galleries. These tunnels are of the lengths respectively of 620, 1260, 1200, 750, 750, 4220, 480, and 2060 feet, not yards. These works land the railway at Koobee, the first village on the Deccan, a mile and a quarter within the precipitous frontier of the ghauts, and 84½ miles from Bombay. The height of the summit is 2062 feet above the sea.

Returning now to Nudvee, we follow the cheaper and more convenient line selected by Mr. Clark in the following season. Instead of turning north at that point, the line continues its easterly course, and, with three tunnels and two river crossings, reaches the foot of the ghaut incline. These tunnels are of the respective lengths of 400 feet at Maholee, 2200 feet at Mahope, and 200 feet at Tulowlee. The incline itself, which arrives at the same point on the table land as the former one, is rather more than thirteen miles long, and has thirteen tunnels, varying from 80 to 760 feet long, the majority being very short,—three from 900 to 1200 feet,—one of 2880 feet,—one

of 4120 feet,—and one, the highest, and the only one to be made with the help of shafts, 5560 feet in length. This line is shorter, as well as more convenient, than that first described, and saves 40,000*l.* on the estimates. Its average inclination is about 1 in 40, and it nowhere much exceeds this rate. It is a matter of some surprise that so excellent a line, over a mountain range which had been universally declared impracticable by a railway, should be obtained by works so light as these; the tunnels, for the most part, are mere holes through jutting spurs of rock; one or two of them, however, involve serious considerations not connected with engineering difficulty or expense, to be adverted to hereafter.

From the top of the ghaut, to both the inland extremities of the survey, the line scarcely requires remark. Up to the bifurcation at Alleh, $20\frac{1}{2}$ miles from the ghaut, and 105 miles from Bombay, it has not a work of magnitude, unless we so denominate the bridge at Ootoor, nor a gradient worse than 1 in 190, except for a short distance near Kamoondée, where it is 1 in 118, but may probably be improved; the average gradient is 1 in 304, and the curves are few and good.

The line surveyed from Alleh to Mhuse, 45 miles long, and terminating at a point $152\frac{1}{2}$ miles from Bombay, may be dismissed with the remark that, except a few bridges over the Kokree and Gaor, and the brooks which fall into them, it has only one distinguishing point in its singularly uniform section, viz., a tunnel of 1600 feet long, through a spur which gives a bend to the river near Seroor. Elsewhere it is nearly a surface line throughout. The northern line has one, perhaps two, tunnels: the first at the Alleh Khind, which may, perhaps, be changed to a cutting; the second at the Amboreh Khind in the range immediately south of the Pera River. The last-mentioned stream, the Mool, and the Boree Nulla, are the rivers to be crossed. The gradients here would require in England no notice, the worst, even in this singular mountainous country, being but 1 in 114, and the average 1 in 174. The curves here, as everywhere on the line, are practically good. The

survey terminated the first season at the Pera River, at a distance of 55 miles from the ghaut, and 140 miles from Bombay. The next season it was extended to Tullehgaom, eleven miles north of the Pera and sixteen miles south of the Godavery, without meeting with necessity for more than surface works; the greater part of the season was spent, on this part of the line, in the revision and improvement of the former survey. The elevations above high water are as follows:—Koobee, at the top of the Malsej Ghaut, 2062 feet; Ootoor, 2014 feet; the bifurcation near Alleh, 2052 feet; the crossing of the Mool River, 1802 feet; the crossing of the Pera River, 1710 feet; and Tullehgaom, 1875 feet; the extremity of the southern survey near Mhuse, twelve miles below the cantonment at Seroor, 1666 feet.

The total length of the surveys is 196 miles, and that of the examinations beyond them about 715 miles more.

The cost of construction of the 176 miles of those lines, surveyed in the first season, the works at the ghaut included, was estimated by the engineers at		£1,927,319
To which Mr. R. Stephenson suggested an addition of 25 per cent., or		481,830
		<hr/> £2,409,149
From which is to be subtracted, also at Mr. Stephenson's suggestion, from making the lines beyond Alleh single instead of double . .		252,874
Total cost of construction and furnishing . .		<hr/> £2,156,275

If the estimate of the engineers were adhered to, the average cost would be 10,950*l.* per mile of double line, the ghaut included; but adopting Mr. Stephenson's addition of 25 per cent., the cost is raised to 12,250*l.* per mile on the average of double and single line. This provides also all the stock necessary for working 180,000 tons of goods per annum, but no more, nor any stock for passenger traffic. In estimating the cost, the highest current or probable prices for work were adopted, and even on these an addition was made, as stated above, of 25 per cent. These facts, as well as the nature of

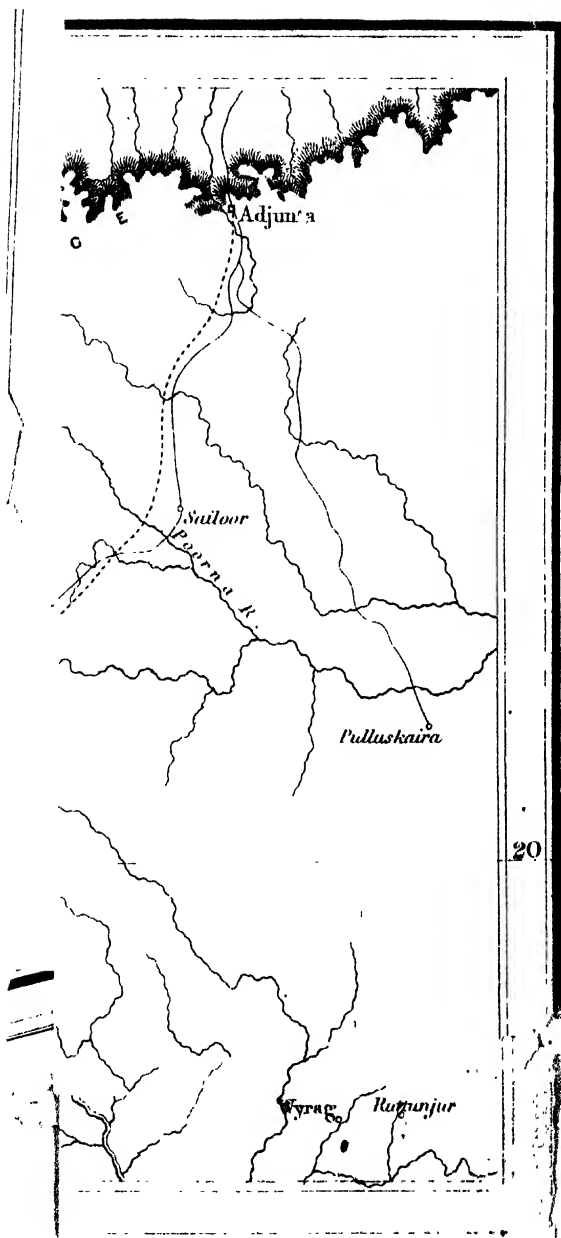
the country, should have due weight whenever these estimates are compared with those of any other Indian line.

The objections to the engineering character of this line relate to the height of the ghaut, and to the occurrence of tunnels, both of which I will now consider. As to a railway, the question is narrowed to a comparison between the Malsej and Bhore Ghaut lines, for other routes are out of the question. (See the papers in the Appendix.) Some notice, however, may also be taken in this view of the route by the Thul Ghaut.

As to the height to be ascended, the first question is the absolute elevation above the sea of the crest of each ghaut, or of the other highest point of each line; the second is the manner in which that height, under the circumstances of each case, can be surmounted. On the first depends the net theoretical amount of power to be expended in lifting the traffic to the Deccan; on the second depend the waste and loss of power to be incurred by the peculiar mode of producing and applying it.

The Malsej Ghaut, according to both surveys and barometric observation, is about 2060 feet above the sea; and this is the highest point to which the southern traffic would have to be lifted;—all inland from the ghaut on that line is a descent. The Alleh Khind alone, on the northern line, presents a higher point; but this, of itself of little importance, does not come within the scope of the present comparison.

Col. Grant, page 87, states "that the height of Kundalla, on the summit of the Bhore Ghaut, is 1750 feet above the sea." The higher elevation of about 50 feet, which my own observations would give it, need hardly be taken into account. But this is not the highest point a line to the Bhore Ghaut would pass over. If, according to the inference I have already founded on Mr. Clark's report, the extreme western scarp of the mountain mass is alone available for the ascent (as I believe it would be in coming from Inora Bunder, or any like point on the coast), then it must pass over a point considerably higher than Kundalla. But whether it came from Inora Bunder or from Callian,



(reaching Kundalla up the northern ravine by the latter route,) it would still have to pass the considerably higher points than Kundalla, which will be found about Karleh, Wurgaom, &c., and in the passage from the valley of the Inderaonee to that of the Powna. The elevation of these spots is little, if any, inferior to that of the crest of the Malsej Ghaut¹. In this single respect, then, the advantage does not materially incline to either side. I will only add here a remark that, as the rise from Kundalla to Karleh is accompanied with very considerable irregularity of surface, there is little chance of avoiding, in this quarter, either bad gradients or expensive works. Dr. Gibson and Mr. Clark will both be found to notice, in the papers in the Appendix, the unfavourable nature of the ground about the head of the Bhore Ghaut.

With respect to the second consideration, it is important to remark that economy in the application of mechanical power, and in the wear and tear of machinery, depends very much on the proper adaptation of the machinery to the work it has to perform, and almost as much on that machinery being so amply master of its work, as not to be subjected to the necessity of being forced constantly up to and beyond its full capabilities. Now a line which was either level or had gradients nearly all alike might have its engines and their loads judiciously adapted to its character, and therefore economical in their action; while another line, level in some parts, and of very different character in others, must have them but ill adapted to one, or the other, or both. If the line on which the ghaut occurs be highly favourable on all its other parts for the due action of locomotives, it may well afford to secure that advan-

Feet above
the sea.

¹ Campolee, at the foot of the Bhore Ghaut	222
Kundalla, travellers' bungalow, in the village near the crest of the ghaut	1770
Karleh, nine miles from the ghaut	2080
Wurgaom, twenty ditto, ditto	1972

From Lieut.-Col. Sykes's barometrical observations, appended to his Second Report on the Deccan, in MS., at the India House.

tage, if needful, by a somewhat higher ascent of the ghaut itself, to be effected by the peculiar machinery prepared and reserved for that purpose; and it would not be a trifling diminution of that actual ascent that would compensate for bad gradients on the locomotive line, whether above or below, by which it was obtained. This remark, which I apprehend would apply with great force to a railway by the Thul Ghaut, where the height of the ghaut seems to be diminished almost one-half by the rapid rise of the most unfavourable country at its foot, is not without bearing even on the Bhore Ghaut line, on the locomotive parts of which, both in the Concan and the Deccan, I believe some severe gradients will be found. Nor is the difference of the actual ascent of the two ghauts, the Bhore and the Malsej, so great as to neutralize in any appreciable degree the effect of the great excellence of the locomotive gradients of the latter. The ascent of the Bhore Ghaut is said to be but 1500 feet, that is, measuring from Campolee, close to its base, to Kundalla; but this is likely to be somewhat exceeded by any railway line made there; that at the Malsej is only 1746 feet; and this difference it may be proper to repeat is not in any sense an addition to the height to which the traffic has to be lifted, but is in fact the consequence of the concentration of the whole lift at one point, where it is effected by means appropriate to it, instead of being encountered dispersedly elsewhere on the line, to be accomplished by the less appropriate and over-taxed agency of the locomotive made only for common gradients. The elevation of the summit level being nearly the same on both sides, the advantage then on this point seems to me to incline to the Malsej.

I make no remark in the nature of a comparison between the different modes of ascent which might be adopted at different ghauts;—as, for instance, between ascent by locomotives at one ghaut, and the use of stationary engines, or other contrivances, which might be required by another. Much depends on the facts of each particular case, which facts, except as to the Malsej, are not yet given or alleged in any instance.

Before I quit this part of the subject, I must give expression to a remark on the strange variations of opinion which have taken place with respect to the railway passage of the ghauts. At first it was confidently asserted by everybody that the ghauts could never be passed by railway at all. Even now, Col. Grant proposes to leave the passage unattempted, and advocates a plan in which its practicability is not ascertained. He says, nevertheless, (page 92,) what others also now say, "Nor have we any reason to suppose that there is any pass along the whole range of the ghaut mountains, including the Bhore Ghaut, that English science would not overcome, or that would probably present more expensive obstacles than the Malsej Ghaut line." The papers in the Appendix will show that there is as little reason for the present indiscriminate assertion of the engineering eligibility of any and every track by which the ghauts have been crossed, as there was for the equally indiscriminate assertion that no ghaut at all was practicable.

We pass now to the consideration of the tunnels on the Malsej line, and the corresponding engineering features of any other line in Western India, and particularly of the Bhore Ghaut line. The occurrence of these tunnels is adduced by Col. Grant as a reason for abandoning the Malsej line. His objections chiefly relate to the cost of executing them, and to that I will principally address myself; for I presume that if this objection be removed, the rest will not be deemed fatal. I premise, however, a remark or two on the minor points. Shafts, it is said, cannot be used, and yet are indispensable. That generally they cannot be used is true; for the several ridges, except in one case, are pierced at depths too great below their summits to permit it;—the tunnels can only be excavated from the two ends. But shafts are not indispensable. Ventilation¹, during the execution of the works, may be

¹ The mines sunk in the Attaveesee in search of gems may show what can be done in India without ventilation.

I have lately been told, but not with sufficient particularity to be able to give

better accomplished by other methods, and at small cost. Time, it is true, will be required, and delay will be incurred which probably no other plan will avoid, yet which will be lamented most deeply, whenever the real bearing of these works on the welfare of India, and of England too, comes to be understood.

The estimate of cost, 64*l.* per yard, which has induced Col. Grant to reject so decidedly the tunnels of the Malsej line, is obtained from an average of ten *English* tunnels; and surely never was there so extraordinary an application of the principle of average. The list, quoted from Weale's "Engineer and Contractor's Pocket Book" for 1847 and 1848, page 65, is as follows:—

instances, that it is not uncommon to find tunnels in the ancient works of irrigation still existing in the western districts of Candesh: in some cases they are said to be carried under the sites of towns.

The following extract from the "Bombay bi-monthly Times" of 2nd Oct., 1850, affords facts bearing on the question:—"We some months back mentioned an enterprise, commenced, and to a considerable extent carried out, near Kurrachee, by one of a race remarkable for anything but peaceful pursuits. An enterprising Belooch of Kelat made an offer to Sir Charles Napier to bring water from the hills to the sea in an underground tunnel or crease, after the manner of his country, without charge to the public, or further recompense to himself than permission to hold the land he was able to irrigate free of charge. Several miles of the work were actually executed, and may yet be seen on the line of the road from the camp to the crocodile tanks. We are not aware of the reason of its discontinuance, but the projector, who would even in this way probably have found his reward, naturally preferred the plan of his country to the much more economical plan of bringing water direct from the Indus. The wonderful tunnels that traverse Afghanistan are obviously calculated, in the first place, to tap at a sufficient depth below the surface the springs which, when exposed, dry up before the summer sun, and, in the second place, to get over the difficulty of surface undulations. The gain of avoidance of evaporation from constant tunnelling, especially through ground where arching would be requisite, is much more than compensated by the primary outlay and the limited capacity of a tunnel compared with that of a canal. But if the less desirable system satisfied the Belooch that it would pay, how much more likely would the substitute suggested ensure an ample return?"

This extract, valuable for its incidental matter, shows that continuous subterranean labour, small area of section, ground requiring lining, and water,—the only difficulties of tunnelling,—are commonly confronted and overcome, in matters of speculation, by Beloochees and Affghans.

	Cost per yard lineal.		
	£	s.	d.
South-Eastern Railway :—			
Bletchingley Tunnel, blue clay, shale, and sand rock . . .	71	18	7
Saltwood Tunnel, middle beds of lower green sand . . .	118	0	0
Brighton Line :—			
Merstham Tunnel, chalk	63	0	0
Clayton Tunnel, chalk and sandstone	51	0	0
Edinburgh and Dalkeith Tunnel, clay	20	0	0
Leeds Tunnel, shale, coal measures and rock	25	0	0
London and Birmingham :—Kilsby Tunnel	125	0	0
Newcastle and North Shields	16	10	0
Midland Railway :—			
Royston Tunnel, red sandstone and bind	50	0	0
Clay Cross, upwards of	100	0	0

Here are costs of works of all sorts, from 16*l.* 10*s.* to 125*l.* per yard running; and without any discrimination as to the applicability of the facts, the lump average of them is taken, as the average of the cost of Indian tunnels, to be made by labour, paid for at a rate, and applied under circumstances, the most different, and to be executed in a rock which has been known and worked for ages. As if, too, expressly to guard against such a misapplication of the facts, the compiler says, “In estimating the cost of tunnelling, reference should be made to the expenditure per lineal yard of the various tunnels that have been completed, *and the stratum through which the work has been driven*, from which, *by comparison*, the amount of outlay may be nearly ascertained.” This is certainly no more than an appropriate, although a scarcely necessary caution, to the use of a table containing particulars so utterly incapable of affording any general conclusion by means of their combined effect.

For let us take the items. The Kilsby Tunnel, which was estimated to cost 40*l.* per yard, cost 130*l.*, owing to its intersecting a quicksand which the trial borings had escaped, and which occupied only 450 yards out of the entire length of 2453 yards. Thus a vast expense was necessarily incurred, in setting up and working pumping machinery, in order to dry the sand. The

pumps brought up nearly 2000 gallons per minute, and were working during a period of nine months. The Saltwood Tunnel, which cost 118*l.* per mile, was driven through the lower green sand, its great cost being occasioned by the great body of water in that stratum. In the case of the Box Tunnel on the Great Western Railway, (which I quote as a fit example, although not included in the list,) "the constant flow of water into the works from the numerous fissures in the rock compelled pumping on a most expensive scale to be adopted. From November, 1837, to July, 1838, the works were suspended, the water having gained so completely over the steam-pump then employed that the portion of the tunnel then completed was filled with water, as also a height of 56 feet in the shafts. A second pump, worked by a steam-engine of 50-horse power, was applied, and enabled the works to be resumed. This tunnel intersects oolite rock, forest marble, and lias marl, with Fuller's earth."¹

Contrasted with such works is the Newcastle and North Shields Tunnel, in the same table, which is merely an ordinary cutting, arched over and filled in for public convenience, and costing but 16*l.* 10*s.* per yard.

The great items in the cost of those tunnels which have been unusually expensive are those occasioned by water, or, in a lower degree, by sand. But there is the strongest reason to rely on the absence of both one and the other in any tunnels to be made on the Malsej line, or, indeed, on any other line in that part of India². The universal rock is an amygdaloidal trap, alternating with matters which look like indurated sediment; not the hard black basalt of Malabar Hill, but a much softer material.

If we take away from the list the four instances in which water and sand have evidently raised very much the cost of the work, viz., the Bletchingley, Saltwood, Kilsby, and Clay Cross

¹ Dempsey's Practical Railway Engineer, pages 109, &c.

² Except, perhaps, the tunnel at the Alleh Khind, which, after all, may be a cutting, and, at any rate, is not involved in the present question.



tunnels, so as to leave a list not so extremely different in its facts from those of Western India, we shall find the average amount to but 37*l.* 12*s.*, instead of the 64*l.* deduced by Col. Grant from the entire list; and thus on the first fair application of his own analogy, we rid his estimate for tunnels, which reaches to 254,784*l.*, of no less than 104,502*l.*, or two-fifths of its amount.

But the cost of labour in India is very different from that in England, *reckoned by the actual expense of completed works*: if to the above reduced amount we were to apply a correction due on this account, we should probably find that we ought to take from that reduced amount not much less than its half; and these fair and obvious considerations would give us for the cost of the tunnels on the ghaut not much more than one-third of the amount assigned to them by my respected opponent, or about 85,000*l.*, instead of 254,784*l.*, or say 2*l.* instead of 6*l.* per yard.

Additional probability is given to this expectation of cost by the fact that circumstances forbid the use of shafts. These customary means of execution in England involve large items of cost. Instead of the expedition they are intended to afford, India must be content, in the long tunnels, with cheapness, though purchased with delay, for the ground does not admit of shafts; and for the shorter tunnels, no shafts at all can be required.

After all, the English list affords no true comparison. Neither labour, nor the material to be worked, nor the attendant circumstances, nor anything concerned, are the same; and the only ground of calculation which can impart any degree of probability to the conclusion must be found in works executed in the country itself, if such there be of a nature near enough to warrant a cautious comparison. For this reason it was that Mr. Clark (I think very rightly) selected the cost of sinking a deep well in the same material which, at worst, will be met with in these tunnels, and by the very class of men to be employed. Considering that the making of this well required

an average lift of 40 feet for the material excavated, besides a greater lift for a considerable quantity of water, neither of which would have an equal representative in the work of a tunnel, it seemed ample to allow the same rate per 100 cubic feet for the tunnel as for the well; and this rule, which was adopted by Mr. Clark, gives 9*l.* per yard lineal, or with Mr. Stephenson's addition of 25 per cent, 11*l.* 5*s.* per yard for a tunnel for a double line; and if due regard be had to the comparative actual costs of other works in the two countries, I apprehend this will be found as probable an estimate as the want of actual precedents then permitted.

The only additional light thrown on this subject since the framing of Mr. Clark's estimate is that afforded by a tunnel which has been very lately made at Sattara, under the encouragement and supervision of Mr. Frere, the very able and excellent commissioner of that territory. This work, which was executed by means of funds subscribed by a number of the servants of his Highness the late Rajah, for some permanent memorial of him, will be, when finished, about 200 feet long; in July last, only ten feet of this length, in the middle, remained to be driven. The circumstances are these:—"Below a very solid bed of the black trap-rock was a thin bed of ferruginous clay, a few inches in thickness, which could be picked out, and the blasting commenced from the top downwards, through the *very* compact amygdaloidal trap-rock which underlies the clay. Capt. Hart," of the Bombay Engineers, "marked out the work at the commencement, and left it to be executed by a native gowndee" (bricklayer or mason), "who had never seen anything of the kind before, and who, probably, never was out of Sattara. The result shows that native workmen would find no difficulty in executing such works. In the present case, the lower surface of the superior bed of trap forms, at present, a perfectly smooth and nearly flat ceiling, when the clay is removed; whether it will stand remains to be seen. The extreme hardness and compactness of the lower bed of trap obviate all necessity for lining, and no supports

for any part of the roof and sides have been found necessary." The cost, compared with the section, would give for the excavation of a tunnel for a double line of rails a figure of about 26*l.* per yard, much less than half Col. Grant's average from English tunnels, although much above Mr. Clark's estimate. But when it is remembered that this work, so unusual in the Deccan, was executed at only this expense, by local workmen, with only native contrivances, and without European professional superintendence, it will be deemed to afford support, rather than contradiction, to the general views adopted on this subject by Mr. Clark.

Confessedly, however, decisive facts are wanting, and only careful trials can supply them. Yet we may see clearly that, whether or not Mr. Clark's estimate be eventually borne out by results, Col. Grant's conclusion has evidently not a sound reason to support it. Suppose, however, the estimate of the former should be doubled in practice (the utmost fear which a fair application of the Sattara example would justify), the addition to the cost of all the tunnels on 176 miles of railway would not exceed one-fifteenth of the gross expense of the line; a proportion which cannot substantially affect the prospects of the undertaking¹.

Cost, however, what they may, is there any probability that tunnels, or works equally costly or disadvantageous, will be avoided on any other line? We are reduced to probabilities in discussing this question, by the omission of all particular information bearing on this subject in relation to the Bhoze Ghaut line, the adoption of which, nevertheless, is so strenuously urged.

The disposition of the physical features of country, as well

¹ It is worth remark, that the fall in the price of iron which has taken place since the estimates were framed is nearly sufficient to cover the above supposable, and only supposable, defect in the estimate for tunnels. I advert to this, not to justify, in any degree, adherence to a really expensive or injudicious project, but simply to show that alarm as to the tunnels has gone greatly beyond the actual bearing of the facts on the prospects of the line.

as the direction taken by the attention of the public, confine the comparison to the Malsej and Bhore Ghaut lines; none other is on a route so practicable as to admit of consideration in competition with them, except, perhaps, the Koosoor Ghaut¹.

Considering the nature of the rocks which constitute the physical mass of Western India in the latitudes to be traversed, and far to the north and south of them, it seems improbable that any line will be found whose ordinary current mileage will not have to encounter some tunnels, or perhaps cuttings, or *détours* equally expensive. Generally speaking, the great mountain masses have table, or sometimes peaked, tops and precipitous sides; the smaller ranges bear a strong general resemblance to them; their bases are narrow in proportion to their height, and also often in proportion to the length of the range; it frequently happens, therefore, that it is cheaper, in making the line, to go through the range than either over or round it, besides that a tunnel affords the great permanent advantage of having, in perpetuity, a shorter line to work. Occasionally these ranges dip below the general surface, and afford passage for a road from valley to valley; but this depression of the range is, I think, almost always accompanied by elevation, disturbance, and confusion of the general level; and at such places, I apprehend, the avoidance of tunnels will commonly be purchased by the occurrence of works of other kinds, as great and costly as they, or possibly, in some cases, of gradients as little to be desired as either. I have already said that these remarks are, of necessity, made in the absence of information as to the details of the line across the Concan advocated by Capt. Graham, and therefore subject to any correction required by actual survey; but, until facts show it to be otherwise, I can hardly think the tunnels of the Malsej line are a disadvantage peculiar to it. In fact even on that line, in the Concan, most of the tunnels might be avoided if it were

¹ The levels of Col. Sykes would lead to a supposition that the Deccan valley of the Koosoor Ghaut is considerably higher than that of the Bhore Ghaut.

best to do so ; but they are adopted to avoid longer and more expensive routes,—a state of things just as likely to be found on other lines across the Concan, and certain to be found on some of them.

The chief consideration, however, affects the ghaut, for there are situated most of the tunnels. When it is considered that the scarps of the ghaut range are, in many places, vertical for a great part of their height, in many more so precipitous as to be impracticable even to unladen men, and that at best, except in a few places, they are highly inclined, and often very irregular, wooded slopes of from 1500 to 1800 feet in height, it will hardly be supposed that the formation of a railway can be effected without considerable works of some kind. To take the most favourable supposition ;—let the line ascend, longitudinally, a uniform and even slope, whose surface, like those often occurring in the ghauts, shall stand at more than 1 perpendicular to 1 horizontal. I apprehend that, in this case, the works, in order to obtain a bench wide enough for a double line, or even two benches, each wide enough for a single one, would be nearly as great in section as a tunnel, while, being continuous, they would require to be executed for the whole distance, instead of only in places like tunnels. The expense in all probability would be at least as great as at the Malsej, perhaps greater¹. Or, if a line be selected which has not this unbroken uniformity of surface, as, for instance, on a projecting spur of the general range, then it is every way likely that it should require tunnels in the same manner as the line by the Malsej. One or other of these cases, according to my recollection, is likely to

¹ This view of the matter receives considerable countenance from the length of time occupied by the construction of the Thul Ghaut road, which has no tunnels, and is but five miles and a half long ; it was commenced in 1836, and has been under the charge of six different officers. Since 1842 its line has been selected and changed three times. It has lately been completed by Lieut. Chapman, who has had the superintendence of the operations ever since 1844. It is a work of great value to the country.

occur at the Bhore Ghaut; and, if so, it is probable that nothing would be gained, in respect of tunnels, by change of route.

But further;—from the disposition of the mountains, in plan, as already explained, the ascent of the Bhore Ghaut, whatever scarp is selected, must be chiefly, perhaps entirely, in a north and south direction, while the required direction of the road is from west to east. The works of the ascent would therefore accomplish the ascent, and nothing more,—they would be lost as to the progress of the road. On the contrary, at the Malsej the ghaut ascent is not only an ascent, but so much also in the very direction of the road. The true comparison, therefore, would be not barely the works of one ascent against those of the other, but that of the *extra* cost of the Malsej ascent over the ordinary cost of the same length of railway in the level country, against the *entire* cost of the ascent at the Bhore Ghaut.

For these reasons I cannot but think it highly probable that, notwithstanding the occurrence of the tunnels, of which so much has been said, the engineering superiority, in point both of original expense of construction and of cost of subsequent working, will be found, on examination, to remain very decidedly with the Malsej line.

Col. Grant proposes a plan for a viaduct railway, on which perhaps, in an engineering view, I am scarcely called to remark; for if it be eligible at all it is just as good for the Malsej as for the Bhore Ghaut line, except, indeed, as it is intended to afford only that very limited means of accommodation and improvement, which is comprised in the conveyance of passengers and parcels by very light trains. Some errors of importance, however, appear to me to be associated with this subject, and to require remark.

The cost per mile of this viaduct railway its inventor sets down (pages 75 and 136) at 8500*l.* of single, or 17,000*l.* of double line; or supposing cutting at 3500*l.* per mile to be

required for one-fifth of the length of the viaduct, the average cost for a single line would be 6000*l.* per mile, and, I suppose I may add, 12,000*l.* for a double one.

Now, at page 104, the distance by rail from Inora Bunder to Poonah is stated to be $78\frac{1}{2}$ miles, which at 6000*l.* or 12,000*l.*, respectively, comes to 471,000*l.* for single, or 942,000*l.* for a double line, without any working stock, stations, vessels for crossing the harbour, or incidental expenses. But at page 114 the following passage occurs:—"The line by Poonah, making that station the first terminus, appears then to offer every advantage that could be desired for the experiment of the first introduction of railways into India, as by an expenditure of little more than 100,000*l.* a really useful and paying line would be made complete in itself: one of the largest native cities, and the most important military station in Western India, would be at once connected with the capital of the Presidency. Such a complete line would offer the very best possible opportunity for testing the adaptedness of steam railways to Indian wants," &c. The meaning of this, as it stands, is unequivocally that a railway may be made between Inora Bunder and Poonah, and may be completed on the viaduct plan for 100,000*l.*, not for 1,000,000*l.*, as the figures evidently require. This is no doubt an error of the press; but since it is very common for readers to take figures for correct, and some may be captivated with the idea of obtaining a line to Poonah for a twentieth part of one into the Deccan by the Malsej Ghaut, it is not unnecessary to point out the mistake.

The viaduct railway, mile for mile, is really the dearest. It would cost at least 6000*l.* for a single, or 12,000*l.* for a double line, besides stations, working stock, &c., and without including the more expensive miles of the ghaut ascent, which, on account of being expensive and difficult, are postponed. But the cost of the Malsej line, railway, working stock, stations, incidental charges, ghaut ascent, tunnels, and everything included, is but 10,950*l.* per mile for a double line.

Both these are estimates. To that for the Malsej line Mr.

Stephenson added 25 per cent. for the effect of the demand for labour, making (with some modification, from partially substituting single for double lines) an average of 12,250*l.* per mile. The estimate for the viaduct line needs this addition as much as the other, and the more so from the labour required by the continued viaduct being of a technical kind, of which the supply must be very limited in comparison of that of the coarse labour available in constructing earth-works. Add this 25 per cent. to Col. Grant's estimate, and it becomes 15,000*l.* per mile of mere railway, together with the cost of everything else to be done or provided, against 12,250*l.* (or for entire double lines, 13,687*l.*) for a line completed, fitted, furnished, and ready for work. As for the probability of exceeding the estimates, it can scarcely be unfair to the new and untried design to say that it applies equally to both.

The more expensive viaduct line so proposed would, avowedly, be unfit for more than light traffic and passengers, and would therefore fulfil but partially the duties of a great line of internal transit: the less costly line of the ordinary kind might possess every improvement devised and tested up to the date of its construction, and would be adapted to every purpose a railway could fulfil, or the community require from it. One, as a singular and exceptional structure, fit for few if any situations, would be a positive obstruction to the extension of the railway system in India; the other would prepare for and lead to a vast extension of that system, and take its own place as a conforming and co-operating member of it.

The only other reason given for preferring this system is, that a line so made would not interrupt the passage of the villagers and their cattle to and from their fields. In support of this very remarkable argument the startling statements are made, page 76, that India is "perfectly uninclosed;" and page 90, that the natives of that country "do not know what an inclosure means." Whatever the case may be with respect to the rest of India, this argument certainly does not apply to the country traversed by the Malsej Ghaut line; to which I need

only add, that cultivation is as much a bar to indiscriminate traversing of the soil as inclosures themselves. The inhabitants of the villages, approached by the railway, would soon find that they had too great an interest in the well-doing of it to permit them to take offence at trifling interruptions between their village and their cattle-field. But if they or any other class of natives should feel aggrieved, what is most likely to be the occasion of it? Look at the history of popular discontent with improvements, and it will be seen that the most common cause of it is the erroneous impression that improvements diminish the demand for labour—an impression which, however erroneous, usually derives some countenance from temporary pressure on the particular persons whose avocations are affected by the change, and who seldom fall willingly or promptly into the new arrangements. If discontent for a time should occur from any such mistaken notion (which is not so very unlikely, as from a railway chancing to interrupt the march of the village bullocks to their pasture), how would a wooden viaduct railway fare, dry as it must be in India for six months in the year? I cannot forbear again remarking, that few more important services could be rendered by its friends to the great cause of Indian improvement, than that of diminishing the tendency to this frequent popular error.

Believing that the foregoing remarks are more than sufficient to show the inexpediency of adopting the design to which they relate, I apprehend it is not necessary to extend them by any observations on the mechanical efficiency or durability of the proposed structure.

This discussion of the engineering characteristics of the two lines, I trust, will serve to rectify some erroneous impressions, and to show that it was not lightly, even on these grounds, that the Malsej route was preferred. I cannot but think that for the first great means of communication between so important a seat of Government and port as Bombay and a country which is so extensive, and which might be so prolific, as the interior of Peninsular India, continuity of structure and certainty of ac-

tion are indispensable qualities. I trust, too, that evidence enough has been given to show that the line by the Malsej Ghaut is, on the whole, the best for construction and working which the country is likely to afford; and I venture to think it has been made apparent that no advantage will be gained by abandoning plans of construction already tried and in universal use, in favour of the very ingenious one proposed by the gallant author, whose views I have felt myself bound to oppose. I need scarcely add, that if future surveys should show that any probabilities I have assumed are not consistent with fact, I shall be amongst the first to welcome whatever advantage the interests of India may derive from better information.

I proceed in the next chapter to consider the circumstances which affect the profits, consequences, and public convenience of the two contrasted lines.

CHAPTER VIII.

THE PROFITS, CONSEQUENCES, AND PUBLIC CONVENIENCE OF THE CONTRASTED LINES.

THE questions to which this chapter is devoted require that we first advert to a consideration very strongly and properly urged by Col. Grant, viz., the effect of any proposed plans on the allocation of English capital to Indian undertakings. He remarks, page 66, that "One great benefit for which we look from the introduction of railways into India, is the investment of *English* capital in Indian concerns, and the drawing the attention of British capitalists to our Indian possessions, which will assuredly never be done by commencing *now* a mode of conveyance which, in his eyes, is looked upon not only as obsolete and out of date, but as failing to take advantage of the advancement of science, and therefore not a system on the furtherance of which he would invest his money, or give his countenance, interest, or support." This being so, are the English debates on mere break of gauge forgotten? And what must be thought of the effect, on English subscriptions, of a proposal which begins with a sea ferry of six miles wide, worked under circumstances not the most favourable, and which, at the ghauts, again breaks, not merely the gauge, but the whole mode of transit, through "failing to take advantage of the advancement of science;" and which does this at a spot, more than any other in the world perhaps, needing, admitting, and inviting the application of science? Is it to be supposed that the present Governor-General, himself one of the great authorities on railways, that the Court of Directors, or the English public, will overlook the enormous disparagement to the working and profits of the undertaking, which must follow such breaches of continuity, or will fail to see that here are gigantic instances

of that which excited so much debate and regret under the title of "break of gauge?"

But it is further proposed to combine with this flinching from the due application of science, in a matter where its aid is indispensable, a needless and very doubtful application of it, in supersession of plans already tried: it is proposed to construct a braced wooden viaduct, on pillars, for the whole length of the line—a plan hitherto untried, depending on workman-like adjustment of innumerable parts, and to be adopted in a country which is destitute, beyond European or American example, of any reasonable amount of decent artisanship. Could anything more effectually discourage an English shareholder?

Nor is even this the worst;—it is proposed still more vitally to depart from European experience, by making the railway only capable of carrying light goods and passengers, and transmitting the heavy goods by another route and another mode of carriage. Is this the way to win the confidence of the English capitalist, who often sees the goods' traffic contribute funds without which no dividend could be paid¹? Is that capitalist likely to put any trust in a line without goods' traffic, in a country where he has been told a hundred times, although perhaps not correctly, that the natives will not travel by railway at all? And is it possible that the most sanguine should embark in an undertaking so peculiar, founded on designs so different from any within their experience, and of which not one single proof is given as to the amount of traffic to be expected? Is English timidity, in respect of Indian affairs,

¹ The following are the receipts of a few leading lines for the 2nd or 3rd week in September, 1850, from Herapath's Journal, September 28.

	Passengers.	Goods.		Passengers.	Goods.
	£	£		£	£
Eastern Counties . . .	8559	5330	North British . . .	2157	1506
East Lancashire . . .	2147	1701	South Eastern . . .	13,225	2981
Lancaster and Carlisle	3510	1495	York, Newcastle, and		
London and North			Berwick . . .	6306	8138
Western . . .	28,848	18,431	York and North Mid-		
London and Brighton	11,555	2332	land	5609	3925

which required a plenary guarantee to overcome it, likely to be rendered courageous and confiding, by proposing plans for distant India, which would not be listened to at home?

For the reasons thus indicated, I apprehend that Col. Grant's highly-important object, of inducing English capital to invest itself in Indian railways, must be promoted by adopting plans more nearly conformed than these are, to those accredited by the success of English usage. Not, indeed, that a slavish and unreasoning adherence to English models under Indian circumstances (much the most probable error) is necessary, or even safe; but adaptation, at once sober and vigilant, of English plans to Indian requirements (which I believe to be highly necessary), effected under the guidance of a competent view of all the principles concerned, is, I apprehend, a very different thing from that wholesale setting aside of English experience on which Col. Grant has ventured.

Let us, however, proceed to examine the circumstances and effects of the lines themselves, supposing them made as proposed; and let the crossing of the harbour be avoided by taking the route by Tannah. The plan of Col. Grant is, in its essence, a line of light railway, of some construction, proceeding by the Bhoze Ghaut to Poonah, while a common road or tramway carries heavy goods by the Thul Ghaut. Such a design, so different from everything done elsewhere, requires careful investigation; and the more so, as not a fact is given to show that the Poonah line, whether restricted or not to the only uses of which its proposed structure is capable, will pay anything, however small, towards its own dividend. It may not improbably depend for its dividend on the Thul Ghaut trade. If the tramway line by Thul Ghaut fail also, which further investigation may show to be not a very distant probability, nothing whatever remains for the reliance of the shareholders.

The first objection, however, to this separation of the traffic into two kinds, each to be carried by its own line, is one of principle. The roads by which the two kinds of traffic are proposed to be conveyed are distant from each other, and cannot

affect the same parts of the country, except perhaps far in the interior. Poonah, and the country in that direction, may have the convenience of parcels and passenger conveyance, but not that of heavy produce; Candeish and Berar may send their heavy produce, but, except in a very inconvenient form, they are to have no conveyance for parcels and passengers. Now, the example, even of England, shows that the development of the powers of a country depends on the possession of both these kinds of accommodation. Canals did for England what it is now proposed that a tramway should do for Candeish; but when railways came, and educated the latent tendencies and wants of society, they showed that the canals, vastly valuable as they had been, had not done half what the country wanted, and the canals themselves profited by the effects of the greater capabilities of their once dreaded rival.

It is not difficult to see how this happens. The intertwined and varied wants and relations of men need both the conveyance of the actual produce of labour and the earth, and the frequent personal intercourse which is to encourage the growth of these healthy wants, and of their indispensable supply. The canal would have carried the goods, but the stage-coach was insufficient for keeping up a due proportion of personal intercourse and intimacy; and even if the mail-coach had been sufficient for the latter object, little inducement would have been created to bring men together, if other means of transit, of a different character, had not existed alongside its route, calculated to facilitate the cheap exchange of their products. Happily, the railway unites much of the laborious effectiveness of the canal, with more than the celerity, and infinitely more than the capacity, of the stage-coach; and a district traversed by a railway of good quality, of the usual construction, lacks nothing of the means of transit requisite to any degree of activity and success.

If these principles have so signally exhibited their influence in England, where all previous modes of transit had been brought to unprecedented perfection, what must be their im-

portance in India, where (except on one short road, and for once a day) no coach exists to make up, in some little degree, for the absence of a railway, and no canal is ready to transport the heavy agricultural produce on which her power of export depends? If there be one country more than another which requires the united action of these two species of transport, that country must be Central Peninsular India, which has neither roads nor rivers.

But the plan of Col. Grant severs this indispensable conjunction, and by it men may communicate through one part of India, and goods may be carried through another; but in neither case can both be done together. Only a fraction, therefore, of the good effects to be fairly expected from railways in India would be experienced, I apprehend, on either line.

If it were a remediable error, possibly this defect of utility might be borne with, and might perhaps be classed, rightly or wrongly, with the inevitable inconveniences of a first step in a new career. But these plans, when once executed, and when once they have absorbed the great capital they must require, will necessarily be permanent and unalterable; and it is scarcely too much to say, that besides being unalterable in themselves, they would prevent, for a period beyond hope, the establishment, in the Bombay Presidency, of anything like a uniform, expanding and effective system of railways.

All this would be true, even if the light line to Poonah, together with the tramway by the Thul Ghaut, could be made for the same capital as a sound and substantial railway. But I have already shown that the Poonah line, by Col. Grant's own estimate, would cost as much as a strong and heavy railway, while it would do only the lightest part of the work; and as one strong line, made at the cost of that light one, would do for the present all the work of the country which could be served by both, the cost of the tramway by the Thul Ghaut would be, as to immediate purposes, just so much waste.

If the railway line, of whatever construction, proceed from Bombay to Poonah, by way of Tannah and the Bhore Ghaut,

the route will be nearly as given below; to understand the necessity for taking the course described, it must be borne in mind that there is little probability of ascending the Bhore Ghaut advantageously, if at all, except the ascent be reached by the route of the Oolassa River: and to take that route it is necessary, for turning the mountains which stretch up the Concan, that the line should proceed due east to some distance beyond Callian. The geographical distances are as follows:—

	Miles.	Direction.
From Bombay to Tannah	22	north.
„ Tannah to a point beyond, and somewhat south of Callian	15	east.
„ the last-mentioned point to the Bhore Ghaut	35	south-east
„ the Bhore Ghaut to Tullegaom	20	nearly east.
„ Tullegaom to Poonah	19	south-east.
Total from Bombay to Poonah	111	

Now, the geographical distance between these two cities is little more than 73 miles.

But further,

	Miles.	Direction.
From Poonah to Ranjungaom, which is nearly in the latitude of Bombay	49	north-east.
Total from Bombay to Ranjungaom	160	

The geographical distance, or the progress due east, is only 108 miles.

	Miles.	Direction.
From Ranjungaom to Ahmednuggur	18	north-east.
„ Ahmednuggur to the Nizam's frontier at the Godavery River	40	north-east.
„ the Godavery to the Ajunta Ghaut	80	north-east.
„ the Ajunta Ghaut to Boorhanpoor	60	north-east.

Total distance by railway from Bombay to Boorhanpoor, geographical distances nearly being taken from one intermediate point to another 358

The distance by the roads between Bombay and Boorhanpoor, taking the route by Poonah, is about 390

The direct geographical distance between the same places is about 265

The extreme circuitousness of this route is obvious. The

line ascends at Tannah to a latitude 22 miles north of Bombay; it descends at Poonah to another latitude 25 miles south of that city. To gain a geographical distance at Poonah of 73 miles, the line passes over 111 miles, besides whatever may be added by local sinuosities of the road. Ranjungaom, 108 miles due east of Bombay, requires a journey of 160 miles; and Boorhanpoor, for a geographical distance of 265 miles, must be content with a road of 358 miles, in straight lines, while probably a railway would require an actual length of 390 miles. Poonah, for whose sole accommodation, in respect to the least part of its trade, this line is proposed, would have to travel by it 38 miles additional to accomplish a nett distance of 73; and all the important country to the north-eastward of Poonah must participate in the disadvantage. Ahmednuggur, Aurungabad, and Berar, must be content that their traffic shall pass by the crooked and costly line, which serves so ill even the interests of Poonah.

It was expressly to avoid the détour by Poonah, for the Calcutta (foot and horse) mail, that, in 1836, a new route was surveyed by the Malsej Ghaut to Aurungabad, and a line was laid out in close proximity to that since surveyed for the railway, up to the summit of the ghaut: three lines were proposed for choice above the ghauts, one of which is there followed by the proposed railway route. These lines, devised under the superintendence of the late Captain Foster (whose just praise is not yet forgotten in the Presidency of Bombay), and surveyed for detail by Lieut. Stuart, gave a travelling distance between Bombay and Aurungabad of $193\frac{1}{2}$ miles, instead of 255, which was the distance by Poonah, being a saving of $61\frac{1}{2}$ miles, or one-fourth; and it is manifest that this contrast would be still further aggravated, if, as is now proposed, the computation were made on a road going round by Tannah, instead of proceeding, as the mail then went, by the shorter way of Panwell. If it was then, and is still, deemed so disadvantageous to carry the Calcutta mail round by Poonah, what must we say to a permanent and costly provision for the railway transit of all the traffic of the country which pursues that objectionable course?"

At page 86, Col. Grant makes a statement on this subject, of which it is not easy to gather the precise meaning, but which in any sense requires correction. It is this:—"Suppose the line of rail to be carried from Bombay to Poonah, thence by Seroor to Ahmednuggur, thence to Aurungabad, and thence by the pass at Ajunta to Boorhanpoor: by this line the distance to Boorhanpoor on the north, and Seroor on the south, whence the southern line would be continued, would be about 356 miles; whereas by the proposed Malsej Ghaut line, the distance to Boorhanpoor on the north, and to Seroor on the south, is about $330 + 36 = 366$ miles."

It might be supposed from this, that to go from Bombay to Boorhanpoor (if it were a particular object to reach the latter point) it would be requisite to travel over 356 miles by the Poonah line, and 366 by the Malsej; but the fact is, that to go round by Tannah, and then by the Bhore Ghaut and Poonah, would make the distance 390 miles, while 333 miles is the distance by the Malsej. Even if the line by the sea ferry and Inora Bunder were adopted, the distance would still be 363 miles, or 30 miles more than by the Malsej, besides the immense disadvantages of the water transit, which have been already discussed. The truth is, that the representation above given does not exhibit the fact, that a line by Poonah requires all the northern traffic to be carried to a point far south of Bombay, and by so much out of its road, while the Malsej line is, on the whole, the shortest for the country in general.

I am quite ready to admit, as I had occasion long ago to assert, that to bring to any one line in Western India at present traffic enough to make a railway pay, it will be necessary to draw that traffic from many quarters, and therefore for the line to take routes which may perhaps be less direct than may be possible in a more advanced state of the system; and the same principle applies as much to the accommodation of different sections of the country as to the profit of the railway. If, therefore, the circuitousness of Col. Grant's line had been incurred under a correct view of the different interests to be

served, I would have admitted it to be an inevitable inconvenience attaching to the early days of the system, to be remedied in the course of its subsequent growth. But when, as I conceive, so tortuous a line affords actually less accommodation to the country than is to be obtained by a shorter one, its additional length, cost, and delay, may well be deemed disadvantages which are aggravated by their needlessness. This point I proceed to illustrate.

The accidental circumstances to which Poonah owes its rise and magnitude were not associated with any special adaptedness of the site of that city to the wants or convenience of even the native and internal commerce of the country: the location is too much entangled in the mountainous offshoots of the ghauts to permit the facility of locomotion and intercourse which a great mart requires. The same consideration operates on present questions, in as far as they relate to the first lines to be made. Whenever the early lines shall have obviated, to some extent, the natural difficulties of the country, Poonah may attain a commercial importance which it has not yet possessed. Meanwhile, a line by Poonah, as proposed, would be liable to the following serious objections.

1. Such a line would not accommodate the traffic of the Gunguthurree and Candeish. The former of these districts, which consists, as its name imports, of the open expanse through which runs the upper course of the river Gunga or Godavery, is perhaps the most fertile district in Western India; of the latter I have already given some facts which show its value. These British provinces are more capable, perhaps, than any other in Western India, of profiting by the action of a railway, and of yielding profit to a railway in return; and a line which omitted to provide for their interests would singularly fail to avail itself of some of the best securities against disappointment, and would equally be wanting to the public advantage. In these remarks might also be included the western parts of the Nizam's dominions in Berar, which contribute

greatly to the supply of cotton, and in which are situated some of the most important cotton marts.

2. A line by Poonah presents no advantage to the traffic of the east and south-east of that city which is not afforded in an equal degree by the Malsej route. When once that traffic, in going from the interior to the coast, has reached a point in the valley of the Beema, which is near the confluence of the Moota Moola with that river, its course to Tannah is very little longer by the Malsej than by the Bhore Ghaut; and if a line were made by the Malsej Ghaut, for the accommodation of the Gunguthurree and Candeish (turning north at Alleh), it would cost vastly less to make a railway from the south-east to join that line, than to carry one by Poonah and down the Bhore Ghaut, the latter having little or no compensating advantage over the former.

3. A line by Poonah, reaching Berar by way of Aurungabad and the Ajunta Ghaut, must pass for 80 or 100 miles through the dominions of the Nizam. I am far from being insensible to the importance of interesting the native princes and people of India in railway enterprise; but the territory of the Hyderabad Government is certainly not that to be chosen for the first attempt, to say nothing of the inevitable delay of gaining the concurrence of a native government, altogether without knowledge of railways or their advantages, and imbued with long-standing jealousy of British activity or interference in any form. In this portion of India, pre-eminent just now in disorder, the dissensions at the seat of Government, and the feebleness of the central authority, have given more than the usual oriental licence to those who happen, for the day, to have farmed the power of the Government in the provinces. Disorganization as to all the true objects of a government, and vigour only in making the greatest gain of the temporary rent of the revenue, or in profiting by power of other kinds, seem to be the characteristics of the several local administrations. Confusion and crime, aggravated by the retention of bands of armed

foreigners, by every man who chooses to hire them, are the result; and even the British frontiers have not always been respected by the bands of marauders formed in this deplorable state of things. Civil war, a dispute tried by arms, between the Nizam and one of his great feudatories, the Nawaub of Ellichpoor, just now (November, 1850), completes this picture of misrule.

Moreover, the old system, or no system, of transit duties, still exists in Hyderabad; and with it the railway system is utterly incompatible. Every talookdar and hukdar (and probably one would be met with in every 15 or 20 miles) would contend for his claims, and has not been unused to fight for them. What probability can there be of the successful, or even the peaceable, operation, in such a country, of a system which goes to interfere with the long-standing usages and the apparent profits of men who are under little control, and who, with their retainers, live by that old system, which they could clearly see the new one would cut up by the roots? Until transit duties are abolished in the Nizam's country, as they have been for 13 years in the British territory, and some degree of security and order is established, it seems altogether out of the question to ask British capital to locate itself there in the form of a railway.

But it must be remarked that, if the railway pass by Poonah, some of the most important purposes it should subserve would depend for their accomplishment on this extension into the Nizam's territory. Without it this line would not do what is requisite for the cotton trade of Berar, and not so much for any such extension of trade with the interior as we have a right to expect from the system. Nor would the mail communication with Calcutta be promoted as it otherwise might be; for when once the line had reached Poonah, it would be dependent for extension towards Calcutta on its traversing the Nizam's country; while on the route through Gandeish not a single difficulty of the kind occurs, at least for several hundreds of miles, on the way to the junction with the Bengal lines; and, if I am not mistaken, not one interruption of native territory occurs on that whole route from Bombay to Calcutta.

If Col. Grant is calculating on the likelihood of an annexation of Hyderabad, it is to be remembered that a political change requires years for its operation, before a country, formerly misgoverned and disorderly, becomes safe and prosperous: a new government cannot all at once change the habits and provide for the wants of a population accustomed to insecurity and wrong. Time may, and I hope will, open a brighter and safer future for Hyderabad, under either native or British rule; and then, but I apprehend not till then, may we venture to invest important sums in the railway system in the Nizam's territory, or to rely on lines located there for great public effects.

Impressed with these views, I felt it to be my duty to insert a clause in the Instructions to the Engineers of the Great Indian Peninsula Railway Company, desiring that in their search for routes they should, if possible, avoid passing over the frontier. Accordingly the lines which are surveyed, while they have great advantages of other kinds, lie entirely in British territory, as do also those explored for extensions. Yet they interfere, in no respect, with the lines which may hereafter be shown to be the best for the Nizam's territories, which I believe will run down the valleys of the Godavery and the Kistna, with cross-lines from north to south. Even Col. Grant's line, from Ahmednuggur to Boorhanpoor, would in time find ample employment, in an improved state of things, notwithstanding the previous construction of the line proposed through the Gunguthurree and Candeish. But it can hardly be thought that a line which, while it ventures into an uneasy foreign territory, omits to provide for some of the most important of our own provinces, is that on which British enterprise should first exert itself.

Pressed, no doubt, with the defects and difficulties of the railway line by Poonah, Col. Grant proposes to accommodate part of the country by means of a tramway by the Thul Ghaut. I have already adverted to the obstacles presented by the engineering character of the country through which such a line would pass, and to the dangerous operation of the principle which separates the traffic, sending the heavy goods by one

route, and the light goods and passengers by another and distant one. I now revert to the action itself of such a tramway, if constructed.

The arguments adduced to substantiate the eligibility of this plan are based on an estimate, at page 141, of the cost of working and maintaining a cart and two bullocks on a common road; from which it is concluded that their first cost would be 88 rupees, or say 9*l.*, and that they may be worked for 300 days in the year, at a cost for driver, food of cattle, and wear and tear, of 172 rupees, or 17*l.* per annum; and, therefore, that if they carried 900 lbs. over 18 miles every day, the prime cost of the carriage would be 1·9*d.* per ton per mile.

Doubting some of these details (as particularly the duration of the bullocks, the weight of the load, and the length of the journey), but admitting them for the sake of argument, I proceed to the obvious remarks, that this estimate omits to consider unavoidable variations in the traffic, during which part of an establishment, adequate to the maximum demand, must be fed, although idle; that it provides only for the mere means of traction and carriage, without collection and delivery of goods, management, or owners' profit; and that it leaves the road to be made and repaired, not by funds drawn from those who use it, but by taxes laid on all the people of every quarter of British India. With these omissions, I am not surprised that it assigns 1·9*d.* per ton per mile as the prime cost of carriage by carts, while the rates between Poonah and Panwell ("the only real road," according to Col. Grant, page 140) are from 2½*d.* to 5*d.* per ton per mile.

It seems to me that in attempting to make any such estimate, the fact is overlooked that it is not prime cost, but demand, which governs the price—the demand, not merely for that description of labour, but for all other kinds to which the persons engaged in it can turn their hands and means. To show, therefore, the primary expense of cart carriage, is going but a part of the way in the investigation. An inquiry conducted on this principle should further show

what inducement will keep up the requisite amount of accommodation, notwithstanding opportunities of employment for the component parts of these primitive establishments which present themselves elsewhere. An inquiry so complicated could never end in a convincing result; but we have a better means of arriving at the conclusion to which, if it could be correctly and completely prosecuted, that very inquiry would of necessity conduct us; for, except during a period of transition to new circumstances, the whole series of causes and consequences, known and unknown, is summed up in the single fact of the market price of carriage. Now the Bhore Ghaut road—that from Panwell to Poonah—whose effects are under discussion, has been opened nearly 20 years; its construction occasioned, I believe, a fall of nearly one-half in the price of carriage between Bombay and Poonah; but its period of transition is over, and the current rates of carriage upon it, which, I believe, were given me correctly, now express, and have for some years expressed, the price at which men will engage in that occupation amongst others which are open to them. Those rates are, as I have said, from $2\frac{1}{2}d.$ to nearly $5d.$ per ton per mile, according to circumstances; and this, I apprehend, is the true matter of comparison with the charges of the railway, and not the figure brought out by any estimate of prime cost of cart carriage. The present carriers, for anything I know, may work their carts as cheaply as is represented by Col. Grant's estimate, or even more so; but why do they not lower their charges to its result? The answer to this question would show the operation of the principle which I have explained.

I am expressly referred, page 146, to the alleged performances of bullocks in carts on the Grand Trunk Road between Allahabad and Cawnpore, where *it is said* that “a pair of bullocks draw a load of 2400 lbs. in a cart, performing 40 miles in 24 hours, travelling night and day, and each pair of bullocks only working twelve miles.” But this tract of country is notoriously the most level in India, and the road is the very

find; yet notwithstanding this great alleged effect of cattle draft, this very line was seriously thought of by the Government, and many others, in preference to the vicinity of Calcutta, for the first essay of the railway system in Northern India. The effect, however, whether great or small, is little to the present purpose. That many persons are misled by analogies drawn from distant parts of the great collection of countries bounded by the Bramhapootra, the Himalayas, the Indus, and the sea, which we call India, I have had frequent occasion to observe; and yet not more reasonable would it be to adduce the price of carriage in Holland or Poland against the prospects of a railway in Switzerland or Spain, than to refer me to the performance of a pair of bullocks at Allahabad, as against a railway over the ghauts—so different are all the circumstances of the two cases. Besides, Col. Grant's reference supposes roads of the first quality to be made all over India; and yet (very properly, but not quite consistently,) he urges the construction of railways, which, according to his argument, cannot compete with them.

It seems, however, to be supposed by Col. Grant, page 141, that bullock carts would have an advantage in cheapness, "if conducted by a company." Here again, I apprehend, is a serious though not uncommon mistake. Every remove from the unity of plan and energy of execution which distinguish private management entails a loss; and in this respect the proceedings of a public joint-stock company hold a middle place between private management, and that most wasteful of all agencies, when applied to commercial business—a government. Experience shows that private enterprise invariably beats public companies, except in the prosecution of objects which from their extent or nature are beyond the means of individuals or of private partnerships. It would not be difficult to specify the causes of this universal consequence; but as Col. Grant gives this subject only the importance of a passing suggestion, I shall be content with expressing a conviction

that he would be much disappointed in any attempt to improve or cheapen cart traffic, by putting it into the hands of a company.

The next suggestion to be considered is (page 142), that if the common road, on the use of which the foregoing estimate was based, were converted into a tramway, the cost of transit would be so reduced as that no railway could compete with it. Here the resistance on a common road is taken at 65 lbs. per ton, and that on a tramway at 9 lbs. per ton, or one-seventh of the former. Assuming, then, the very doubtful proposition that the costs follow the proportion of the resistance, our author concludes that the cost of carriage on a tramway will be but one-seventh of that on a common road, or that it will be one-seventh of the cost exhibited by his former estimate of 1.9*d.* per ton per mile, or 0.272*d.* I may remark that experience does not seem to warrant a belief in this very great disparity between the drafts on the two kinds of road. The Commercial Road in London, besides being a wide macadamized road, has a line of this kind, in fair condition: a stretch of more than half a mile of it is visible at once, and I not unfrequently see it. It is very common to observe carriages of all kinds, going at all speeds, and not one of them on the tramway. Although the very heavily-laden carriages from the docks commonly avail themselves of it, there would be little error in predicting that, at any given moment, more carriages would be found off the tramway than on it. So great a difference as that between 65 lbs. and 9 lbs. a ton for draft, seems therefore not to be attributable to a tramway, although doubtless some advantage is derived from the use of that kind of road.

More than one serious error, however, lurks in the argument. The draft of 65 lbs. per ton is due not exclusively to the nature of the road, but in part also to the coarseness of the axles and the inaccuracy of the wheels of common carriages; while the other, of 9 lbs. per ton, is that not merely of a better road, but of wheels and axles made with the correctness of millwork.

The latter, in fact, is very nearly the resistance of railway carriages¹, and to justify its adoption in the case of a tramroad, the carriages employed must be of a vastly improved description,—must in fact be equal, in mechanical excellence and cost, to railway carriages; and even then, according to all analogy, the resistance would be much more than 9 lbs. per ton, and, of course, according to the argument of Col. Grant, the cost much more than 0·272*d.* per ton per mile.

For the sake, however, of pursuing a still more important consideration, I will assume that 0·272*d.* per ton per mile may be the cost of draught on a tramway in India; but then, like the draughts from which it is argumentatively deduced, it is the cost on a *level* tramway; and to this cost we have to add that of ascending all the successive eminences of the road, and even of maintaining a team capable of ascending the most severe of them. Col. Grant says, page 142, that a tramway would cost 2000*l.* per mile; but it does not appear to what gradients the road is to be cut down for this money, nor whether, as is more probable, that would not be the cost of a tramroad with such inclinations as the country, slightly corrected, might happen to afford. But if the road is supposed to be so good as to admit of the application of the argument, then far the greater part of the expense of making a railway must have been laid out on it; if, on the contrary, it be not so good, but be a mere surface line, then the comparison does not hold, and many times the computed cost would be the real cost of draught upon it.

To give figures:—I have before me an abstract of the

¹ The friction of railway carriages seems, by concurrence of many experiments, to be fixed at about 6 lbs. per ton. Fambour on Locomotive Engines, p. 161. Management of Locomotive Engines, in Weale's new edition of Tredgold, pp. 44, 46, &c.; but these are resistances on *level* lines, practically without curves, and with everything in good order. No doubt the wagon resistance, of common daily practice on railways, independent of the resistance of the air at high velocities, reaches nearly to 9 lbs. per ton.

accounts of the North Staffordshire Railway, no unfair case; the costs per double mile on this line were as follows:—

Rails, chairs, and turn-tables	£3,474
Other works of the line	13,958
Stations	1,985
Total cost of the line proper	<u>£19,417¹</u>

Here the works necessary to obtain continuity and levels were four times as great as those of the special and distinguishing superstructure of the railway; and costs in some such proportion must be incurred before the case is made to admit the application of Col. Grant's estimate of cost of draught.

But if such costs be *not* incurred, and the line be left with such levels as the surface of the country may supply, then we may fairly suppose the following case, which indeed is likely to fall far short of the severities of any route across the Northern Concan. Let the worst ascent on the road be one in 16:—then the draught, instead of being only 9 lbs. per ton, will be $\frac{2240}{16}$ lbs. additional, or in all 149 lbs., and the cost of draught, by the principle Col. Grant adopts, will be not 0·272*d.*, or a little more than one farthing per ton per mile, but 4½*d.*, or sixteen times that amount. That is—having provided power only for a dead level, you come to a hill which you have not cut down, and it takes sixteen or eighteen times as much power

¹ The following items complete the abstract of cost of this line: one instance of the kind may suffice to afford a general idea of the relative sums expended on the different objects involved in the establishment of the English railway system:—

	Per mile.
Expenses up to the incorporation of the company . . .	£1,172
Management and direction during construction . . .	671
Legal and Parliamentary expenses during do.	170
Land and compensation	4,681
Electric telegraph	129
Working stock, tools and appliances	2,237
Incidental and Miscellaneous	32
Total (with the items given in the text)	<u>£28,509</u>

to pull your carriage up the hill as it did to draw it on the level; and as such hills occur many times on your road, you must take your cattle with you all the way, (as indeed you must probably have done had there been but one such hill,) and your expenses are sixteen times as much as you had reckoned on; you had then better have been content with a common road, of which the cost would have been much less, and the draught, all things considered, not much more¹.

If, to avoid this enormous constant cost in draught, you cut down your hills, then you had better make a railway of your road at once; for an entire iron superstructure, rails, chairs, sleepers, and all, may be sent from England, at present prices of iron, for not much more than 2000*l.* per single mile, and then you have not merely a cattle line, but a structure capable of all kinds of work, from the heaviest weights to the highest speeds. The truth on these matters is very much obscured by the common, but erroneous, supposition that the great costs of a railway lie in its distinctive upper works, or actual road: contrariwise, they usually lie in the works for gaining continuity and levels.

To apply these considerations to the case before us. The question in respect to the Thul Ghaut line is now seen to be this: can a line be found in that direction so level as to admit the application of Col. Grant's computation of 0·272*l.* per ton per mile for draught; or one at all approaching to it? If not, his argument utterly fails; if a line be not *found*, but *made*, as good, very little more would make it a railway.

A still further view of the case requires discussion: if a railway, or a line as good as a railway, were already made, with

¹ I doubt much whether another serious objection does not lie against the tramway in a road consisting of long ascents and descents. Uniform pressure on the same limbs and muscles, for a considerable length of time, is much more destructive to the animal system than a greater strain, which is varied in direction and amount; and in its application to different parts of the body. This is one of those questions which naked mechanical science, uncombined with other considerations, will not determine. I apprehend, however, that from this cause a tramway up the ghauts is not one of the safest proposals.

carriages of corresponding quality, then it will be seen, just now, that on such a line, even in India, steam draught is cheaper than cattle draught, although all the fuel were carried from England. Col. Grant's estimate of $0\cdot272d.$ per ton per mile, if admitted at all, is really that of the cost of cattle draught on a railway which is everywhere perfectly level: but it is a railway of very unusual excellence which has not on it a gradient of more than 1 in 240, at which rate the cost of draught would be just doubled, the additional power required for the ascent being 9 lbs. per ton, or exactly equal to that assumed as required for the resistance from other causes; adopting that as a supposed maximum gradient, the cost of draught would be twice $0\cdot272d.$, or $0\cdot544d.$ per ton per mile. For the purposes of comparative argument I will take this rate as admitted, liable though it be to serious objection. This cost includes the expense of

1. Draught proper;
2. Repairs of Carriages;
3. Renewals of Stock:—and nothing more, whether of management, collection, and delivery of goods, or any other charges.

I will now collect the same particulars in respect of steam draught, including the effect of ordinary gradients.

1. *Draught proper.*—For this I take the account of the Midland Counties Railway for the latter half of 1843; although by so doing my argument loses the advantage of some improvements made since that date. These accounts, however, are in greater detail than any other I possess; they refer to a period previous to the late breaking in of the tide of speculation, and their gross results are sufficiently near to later instances on other lines to show that their particulars may be relied on. The expenses, too, at that time seem to have been in a course of reduction; and consequently these are not the lowest; they are those of working goods engines; they do not materially differ from those of passenger engines; and they are the most appropriate to our purpose. For conciseness I give them in the form of costs per train per mile, by a simple reduction

from the accounts themselves. In the second column are the costs which are probably the highest that can occur in India.

	Cost of working Locomotive Goods Engines, in price per train per mile.	
	English.	Indian.
Engine and fireman's wages	1.1121	
For India multiply by 2.5. . . . .	.....	2.7802
Fuel—624 of coke, at 18s. 4½d. per ton, to 285 of coal, at 9s. 2½d. per do.	3.4949	
For India take all fuel as coke delivered at Bombay, at 60s.	66s.	14.7924
Add for waste and deterioration by the voyage, 10 per cent., 6s.		
Oil and Tallow	0.2263	
For India the same. . . . .	.....	0.2263
Hose pipes, fire-tools, &c., supplied to each engine	0.0465	
For India multiply by 2. . . . .	.....	0.0930
Repairs of engines	2.1599	
For India multiply by 3. . . . .	.....	6.4797
General charges, as superintendent's salary, out-door foreman's wages, cokers, cleaners, fuel for spare engines and getting up steam, gas, firewood, &c. &c.	2.3202	
For India multiply by 2. . . . .	.....	4.6404
Total cost of <i>Draught proper</i> per train per mile	9.3599	29.0120

In the same accounts the like costs of passenger trains are shown to amount to 9.52*d.* per train per mile.

The trustworthiness of this statement for the present purpose is confirmed, as well by other documents of recent date, as by the contract entered into in June, 1849, between the North Staffordshire Railway Company and Mr. Wright. Under this contract that gentleman works all the trains of the company, finding servants, fuel, materials, and everything necessary, and keeps in repair all their engines and carriages, receiving 10*d.* per mile for each passenger, and 11*d.* per mile for each goods train: out of this he pays rent for the buildings and apparatus of the Company which he uses, takes on himself their contracts for water, and submits to a stoppage for deterioration of stock

according to the distance run. After these deductions, his net cost cannot be greater than that given in the foregoing table; and I believe he has no wish to give up the contract.

I take, then, the English figures in the table as sufficiently proved; and it seems to me that the ratio in which I have increased each of them for India, is not likely to be exceeded. I am not aware of a safer method of deducing the probable cost under this head in India, and I therefore take the "draught proper" at 29·012*d.* per train per mile, effect of gradients included.

2. *Repairs of Carriages.*—Col. Grant omits all current repairs of carriages, except the renewal of wheel-tires. For this item, in steam draught I have not better details than are published; but a variety of statements show that the repair of carriages is always less than that of the engines simultaneously used with them; in some cases not much more than half. I am willing, however, to take it at the same amount, or for India, as in the foregoing table, 6·4797*d.* per train per mile.

3. *Renewals of Stock.*—The clearest authority on this debated point is that of Mr. Wright's contract, just adverted to. The depreciation is there valued thus:—

	Pence per train per Mile.
For each locomotive	1½ <i>d.</i>
For each first-class carriage	½
„ second-class „	⅙
„ third-class „	⅓
For each carriage of any other kind .	⅓

Now if we take a train as carrying 100 tons of net or paying weight, (Mr. Wright's contract refers to 125 tons,) distributed on 33 goods carriages, the sum for depreciation, according to the above terms, would be $1\frac{1}{2}d + (33 \times \frac{1}{3}d) = 4\cdot25d.$ per train per mile. I am willing, however, to obviate all possible objection from the climate and circumstances of India, by adopting the following extreme supposition:—Let a train consist of one locomotive, value 2000*l.*, and of 33 goods trucks, &c., value

3300*l.*, and add 2700*l.* for accessory articles and spare stock; let this stock travel 100 miles a day, for 150 days per annum, and last 10 years; then the depreciation amounts to 12*8d.* per train, per mile, omitting the reduction which might be effected by interest on the early sums set apart to meet it.

I take 100 tons as the average load of goods trains; a weight which English practice more than justifies, and which could probably always be secured in India, by a due arrangement of the trains, and other matters.

The comparison then stands as follows:—

	Pence per ton per Mile.
BULLOCK-DRAUGHT on a railway, or on a road, and with carriages as good, according to Col. Grant's estimate, adding, as requisite, for overcoming gradients not worse than 1 in 240	0.544
STEAM-DRAUGHT, as deduced from actual English costs, viz.,	
Draft proper, as above	29.012
Repairs of carriages, say	6.480
Depreciation or renewal fund, say	12.800
	<hr/>
	48.292
Or, (the train carrying 100 tons)	0.483
Difference in favour of steam-draught, about 12 per cent. . . . .	.061

It can hardly be alleged that in these parallel estimates any unfounded advantages in the argument have been given to steam draught: my purpose, at least, has been to place the result of the comparison beyond reasonable doubt.

Nor has any account been taken of the probable saving to be effected by using wood for fuel, which would, perhaps, at first amount to 7*d.* per train, per mile. If these things be so,—if, on the same roads, necessarily railroads, or as good as railroads, in either case, steam draught at 150 or 200 miles a day, is as cheap as bullock draught at 40, no question, I imagine, need be asked as to the system to be preferred.

It may be necessary to add that this comparison affects only the cost of carriage on the line; the incidental charges of

management, collection and delivery of goods, repair of roads, &c., may be taken as the same on both sides¹.

¹ This conclusion directly affects a question which has been much discussed, viz., whether common roads should not precede railways in India? If, however, draught on railways, *profit on the invested capital included*, be cheaper than that on common roads,* it cannot admit of a doubt that railways ought to be made at once. But whether steam-draught is or is not cheaper, when that requisite profit is included, depends on the amount of goods which the road carries. A road of small traffic would have to take the profit on the fixed capital out of a small number of tons—the more from each; a road of large traffic would take it from a larger number of tons—the less from each.

If a railway cost 10,000*l.* per mile, if its cost of draught and management were 0·9*d.* per ton per mile, and its charge were 2½*d.* per ton per mile, a goods traffic only, of 130,000 tons per annum, would give a profit of 10 per cent. Half that traffic would give *less* than half the profit, and double that traffic would give *more* than double that profit, for obvious reasons.

Let us now take the case of a common road, which, from Major Peat's reports, could probably be made for 1000*l.* per mile, metalled and bridged throughout; and let us add 800*l.* per mile for the carts and bullocks requisite for a traffic of 130,000 tons per annum, and 600*l.* per mile for all other costs: we shall find that, taking Col. Grant's estimate of prime cost of *draught only*, viz., 1·9*d.* per ton per mile, and adding but 0·35*d.* for all other expenses, repairs of road, management, collection and delivery of goods included, the same charge of 2½*d.* per ton per mile, would afford but the same profit on the smaller original capital of the common road as it gave on the larger capital of the railway. This is owing to the current cost of working in one case equalling the profit on the capital in the other.

But the case of a line of small traffic would be very different; for the saving on the working of it would not pay the interest on the cost of construction; and there a common road is to be chosen.

These very obvious principles, applied to the known or probable facts of any case, easily show when a common road and when a railway is to be preferred; and they seem to prove clearly that the first thing to be done in the Bombay Presidency is to make trunk lines of railway, for the cheap working of the large tonnage which will come on them; and the next is to make branch common roads in connection with them. No figures I have yet met with lead to any other conclusion.

This additional effect attends the choice between common roads and railways in the case of large tonnage. According to all testimony, a charge of 2½*d.* per ton per mile is the lowest, or below the lowest, at which the working of a common road and carts could be continued: but it is not so with a railway: a large reduction of that charge would be practicable, and in time would certainly take place, in the case of a railway, but would probably never be effected so long as common roads only were used.

Reverting to a macadamized road, by the Thul Ghaut for the north-eastern traffic, including that of Candeish and Berar, instead of the tramroad, whose merits have just been discussed, it is sufficient to remark, that Col. Grant's own estimate of the prime cost of carriage on such a road, viz., 1·9*d.* per ton per mile, is quite enough to show the insufficiency of any such plan. This estimated cost leaves collection of goods, management, profit, and some repairs, still to be added, by which it would be raised nearly, if not quite, to the present average rate of carriage; and besides this, there is left on the whole people of British India, through their government, the cost of making and keeping up the road. On the other hand, as I have already shown¹, the costs of all kinds connected with a railway, including repairs of the road, are estimated at not more than 0·94*d.*, or say 1*d.* per ton per mile—about half the cost for draught only by bullocks on a common road.

If, then, I have not greatly mistaken the force of the facts and probabilities which have been adduced, it is scarcely possible to avoid the following conclusions:—1st. That it is improbable that even a really good common road will be found across the Northern Concan to the Thul Ghaut. 2nd. That if such a road be found, and used merely as a common road, it will not be a sufficient advance on the present state of things, or serve as an adequate basis for a general improvement of the cotton trade or of the country, 3rd. That if such a road be converted into a tramway, with suitable gradients, it had better be made a railway at once; and, 4th. That on a railway, or any road as good as a railway, steam draught in India would be at least as cheap as bullock draught, and probably much cheaper.

Considered as a means of supplying the defects of the interrupted railway line for light goods by Poonah, a common road by the Thul Ghaut would be insufficient, as has appeared from an examination of the very data given for its support; while the proposing of such a subsidiary line is an ample acknowledgment of the inadequacy of the principal railway line.

¹ Page 191; see also Appendix C.

I proceed now to defend the Malsej line against some statements made in respect of it. The first of these to be noticed is (page 87), that "on the Malsej line, for the first 350 miles, the Bheels of the jungles, or the wild beasts of the forests, would be nearly the sole representatives of animal life with whom such communications (those by the electric telegraph) could be made." Although this statement is made incidentally with respect to the use of the electric telegraph, I presume it is equally to be understood as a description of the country traversed by the Malsej line; and the more so as, at page 84, it is said, that "no line could have been selected of so little *general* usefulness as this Malsej Ghaut line." I purpose immediately to show how utterly mistaken is this statement; but I wish first to remark, that since by far the greater part of the traffic would come from beyond the extremities of any length of the line yet surveyed, the condition of the country actually traversed so far, is of minor importance to the commercial success of the undertaking; that in fact it would be almost as little against this line to say that it traverses a thinly-peopled country, as it would be against Cunard's steamers to say, that they passed no house between Liverpool and New Brunswick. The gain by the intermediate country was made little or no account of: if that country should add to the traffic, well; if not, there would be very little failure of that which actually was reckoned on.

If, indeed, we had choice of lines for reaching the further country, which must, after all, supply the greatest part of the traffic, we might well take that which would also derive the greatest advantages from the intermediate country traversed. Here, however, for physical reasons, we have little choice; and what, after Col. Grant's account of the matter, may appear remarkable, the line by the Malsej, chosen for its general utility, traverses moreover the most fertile, open, and populated districts of this part of the Bombay presidency. The following quotations will bear out my assertion; they are from the letters of the several collectors of districts, written in 1837, on occasion of

the proposal for a common road from Tannah by the Malsej Ghaut, to which I have already referred,—from the collectors of the same districts, in 1847, in relation to this railway,—and from the officers before-mentioned, as having described the country to me, in reference to its engineering features.

From Bombay to Tannah, and thence to Callian, I presume the line admits, in this respect, of no question. A city of 400,000 inhabitants, and two towns of 20,000 and 40,000 respectively, do not permit it to be said of a line 35 miles long, that it is placed in a desert.

Mr. Giberne, collector of Tannah, said, in a letter of 15th October, 1837, “the proposed line of road intersects the collectorate at its greatest breadth, and is carried through some of the best districts in Callian and Moorbar.” This description carries the line three-fourths across the Concan. He proceeds, —“It continues through Khedool and Wyshakree, the most remote and backward in the scale of improvement and civilization; the inhabitants of the latter, together with those of the neighbouring districts, have hitherto been doomed to a stationary mode of existence, from want of an easy communication with the more distant and flourishing markets.” After testifying to the intelligence of the people, and their willingness to improve, and describing their depressed condition for want of roads, he says, “These districts would soon feel the advantages of a road through them; and with a little employment of capital, I am much mistaken if some of the most valuable products may not be cultivated there; but a road is the first desideratum, and when once that is formed, improvements of all descriptions will follow.”

Under date of 25th September, 1837, Capt. Foster—then Superintendent of the Department of Roads and Tanks, and the immediate official superior of Lieut. Stuart, who surveyed the line of common road just mentioned, which runs very near the line of the railway—states that one of the objects of a search for a line there was, the “opening some cart road through the

rich talookas of the Northern Concan and the Poonah collectorates."

The late Mr. Langford, writing to me in 1846, says of the railway line proposed through the Concan, "All these evils" (viz. a broken country, thick and general jungle, and, at certain seasons, a *dangerously unhealthy road*) "*you escape by the Malsej route, and have the advantage of a tolerably populous country between Callian and the bottom of the ghaut.*"

These testimonies take us to the top of the ghaut; and it is only necessary to add that the Chone jungles, crossed in Moorbar, while not extensive enough to affect the general character of the line, will probably supply traffic to the railway in firewood and charcoal; and that the wooded districts of the ghauts themselves, of a few miles in breadth, are even now the source of supply for timber to the towns of the Deccan, for a great distance eastward, although the cost of carriage is enormous, and the waste in reducing the dimensions of the timber, to suit the means of carrying it up the ghaut, is still greater.

Of the country above the ghaut, Capt. Foster says, "The produce of some, and indeed of all the most fertile districts," instancing Jooneer, Ootoor, and others close to the line, "can meet with no outlet to the coast save by the most wretched tracts, communicating with these distant points." Dr. Gibson says, "No amount of prejudice or misrepresentation can succeed in distorting the very patent features of this, the Murr valley. The country from Murr to Alleh is throughout open and healthy." In my notes of Capt. (now Major) Liddel's verbal description of this valley, I find it said to be "perfectly level and very rich." From the head of the ghaut to Dingora, nine miles, the valley, which is from three to four miles wide, is much cultivated; at that place it expands to an uninterrupted width of nearly ten miles, and the plains which here commence, and which offer small obstruction to the view for miles together, accompany the Kokree, the Goor, and the Beema, with little intermission, to Sholapoor. This first district

of them, extending to a distance of 25 miles, contains Jooneer, entitled a city, six miles from the railway, with the market towns of Murr, Ootoor, Peepulwundee, Narayungaon, Munchur, Alleh, and Beyla, each, except the first, having several thousand inhabitants. Paper is manufactured at Jooneer and Ootoor; cloths are dyed to a considerable extent at Narayungaon; Peepulwundee is a well-frequented corn market; Alleh produces excellent fruits of various kinds, which are sent to Poonah, and sometimes even to Bombay; and Beyla is celebrated for its growth of betel leaves, so much used in the courtesies of Hindoo society. Great part of the land is cultivated, and often with considerable care. The products are wheat, chenna or gram, jowaree, bajree, pepper, castor oil, senna, various oil plants, potatoes, sugar-cane, &c., &c. In this district are the Government Botanical Garden at Hewra and its outlier at Jooneer, both under the care of Dr. Gibson; and here are located the mulberry plantations and silk-worm houses, formerly superintended for Government by the late M. Mutti. At Jooneer is a manufactory of sugar and rum, belonging to Mr. Dickenson; and the coarse sugar of the country is made to a considerable extent in all the neighbourhood. The villages are numerous, although sometimes small, and the average population cannot be less than 100 to the square mile. Many of the coolies, employed in Bombay, are from this quarter; they migrate annually to earn, in the fair season, the higher wages of Bombay, and return to cultivate their fields on the approach of the rains; from a small district of 35 villages, no less than 700 of these labourers annually resort to Bombay, besides many others.

Turning now to the north at Alleh, the line, for 24 miles, traverses a country heavily covered with mountain ranges; but even here cultivation appears in the valleys, and lands duly protected and inclosed bear apparently well-earned crops. The villages, indeed, are not numerous, nor the population large; but the country is neither deserted nor neglected.

The line then enters what is called by Mr. Langford, "the fine level of the Sungumnair district." Sungumnair itself

is a town of more than 7000 inhabitants, within seven miles of the line.

The open and level expanse of the Gunguthurree, nearly 40 miles wide, is now crossed: it is remarkable for its enduring fertility, and for the facility of its cultivation. Here, it is said, "a man may plough the ground, and his grandson continue to sow it." Yewlah, known for its manufactures of silk, is passed by the line. Various towns of importance, besides numerous villages, are scattered in this well-known region, of which many will feel the immediate convenience of the railway, and nearly all will be advantageously affected by it.

The then acting collector of Candeish, Mr. H. Young, on the 11th of February, 1847, writes respecting the railway as follows:—After describing its proposed course correctly, except in one immaterial point, he says, "This course will be through some of the most fertile districts of this province, more especially through those best adapted for cotton cultivation. Had the line of the railway reference solely to the conveniences and exigencies of Candeish itself, I do not know that its position could have been better selected. If there be a district in India which is calculated more than another to benefit by the contemplated improved means of communication with the coast, I should say that it is that part of this province through which the proposed line runs. Reaching the rich plains of the Taptee, by the valley of the Girna, and passing through the prosperous and fertile talook of Sowda, it cannot fail to act as a powerful stimulus to the remarkable productive powers of the soil it traverses." "Mr. Crawford has already noticed the advantageous position of the proposed railway, as intercepting the produce of the Nizam's country on its way to Bombay. It is no less advantageous as crossing, at a distance of about 250 miles from the coast, at Borenar and Nusseerabad, the route taken by the cotton and other products of Berar, while the whole trade of Malwa, and all central India, with the western coast, fall, at a still more distant point, upon the contemplated line of operations."

Finally:—at the other or southern extremity of the system, as so far investigated, Mr. Coles, the collector of Sholapoor, writes of the proposed railway, under date of 10th of February, 1847, as follows:—"The present traffic of the district is much increased of late; a good deal of cloth is manufactured in the southern districts and at Sholapoor, and forwarded to various parts of the Deccan; great quantities of cotton are yearly sent through Barsee to Bombay, for our own and his Highness the Nizam's districts, which, in its transit, is exposed to much injury, as the bales are packed in the loosest manner, and from the difficulty of conveyance it is greatly delayed. Much of last year's cotton is even now daily passing my encampment. Oil and ghee, as well as cattle and grain, especially grain, which is grown abundantly above the Bala Ghaut, near Wyrag, are also exported. The country is dependent on the coast for its supply of salt, spices, metals, and English cotton goods, the import of which would be greatly increased."

"The improvement it would be likely to afford to the agriculture of the northern districts" (of the collectorate of Sholapoor) "would be very great. At present the introduction of carts, although no doubt of much benefit to the traffic of the country, often draws away the cattle of the cultivator from their legitimate use, at the very time of the year when they should be preparing the land for the coming season. Short trips between the railway and the adjoining market towns would employ these cattle when idle, without wearing them out, as they must now do, by long journeys to Panwell and other places, from which they return little fitted for the agricultural labour required of them."

"As the proposed lines of railway would run through the heart of the northern districts, it is hardly necessary to point out the immense advantage it would be, in a public point of view, both from the rapidity with which intelligence could be forwarded to the country adjoining the rail, and from thence to other parts of the country, as well as acting as a barrier against the incursions of marauders from the Nizam's country,

who have at present the character of being concerned in most of the depredations committed in these parts."

These statements, derived for the most part from the highest official authority connected with each district, will probably be held to justify my surprise at the assertions of Col. Grant which I have already quoted. I will only add to them the remark that a good map of the physical geography of the Bombay presidency would show at once that the line by the Malsej Ghaut traverses the broadest, and, therefore, the most productive valleys; and however little the configuration of the country, with the derivation of the various matters of traffic, may have permitted the railway, for the present, to approach military stations, originally located with no view to such considerations, it will be found that the industrial interests of the country were as carefully provided for as perhaps they could be, by the confessedly incomplete facilities of a first line.

It is urged, page 83, that the lines ought to be devised so as not only to be available for the transit of cotton and other native produce, but to do more,—to be of use and application to the community in general, as well as to the merchant. I have not quoted the words fully, although in sense correctly, being here concerned only with the principle they involve, and not with the instance to which they are applied. Now it must be evident that, as merchants and dealers of all classes are only agents between producers and consumers, whatever line of traffic most serves the merchants in general of a country, most serves the people whose transactions they manage, and whose means of mutual advantage they bring together. Circumstanced as India is, and doubtful as we yet are of the amount and character of the future passenger traffic, the safest conclusion is, that that line which will carry the greatest quantity of goods, is that which will most benefit both the proprietors of the railway and the people of India. Col. Grant says, page 87, "On the other" (the Malsej) "line, nothing but the cotton, grain, salt, and such heavy articles could be required." I do not admit the truth of this; but even if it were so, the

three articles mentioned by name, as in the opinion of Col. Grant likely to go by the Malsej, constitute 150,000 tons out of the 180,000 tons per annum of the estimated traffic of that line¹; and out of the remaining 30,000 tons, probably not 3000 are for the use of Europeans, or of military stations².

Perhaps I ought not entirely to pass over some inconsistencies in the arguments and purposes which many have urged, and which are more distinctly than by other persons set before the public by Col. Grant. He objects, erroneously, to the railway by the Malsej Ghaut that it will supersede the road by the Thul Ghaut 40 miles off, while he proposes a line at the Bhore Ghaut, which, if good at all, must supersede the excellent road that runs close by it. He urges that the line from Inora Bunder will open a new country,—that is, for some 30 miles,—in the valley of the Apta, while he fails to observe that

	Tons
¹ Viz., Cotton, per annum . .	18,000
Grain, „ . .	55,000
Salt, „ . .	80,000
	<hr/>
	153,000

(See Report, Maps and Papers of the Great Indian Peninsula Railway Company, pages 35 and 47.)

² All the articles exported from Bombay to the Concan, and through it to the interior, which can be supposed to be intended, in whole or in part, for European use, are as follows, on the average of six years:—

	Tons		Tons
Almonds	85	Sugar candy	167
Beer	645	Spices	118
China and earthenware . .	134	Tea	25
Hardware	8	Tobacco	26
Leather and saddlery . . .	124	Wines	166
Medicines and drugs . . .	868	Woollens	57
Piece goods	891		
Spirits	166	Total	3182

(See Report, Maps and Papers of the Great Indian Peninsula Railway Company, page 32, &c.)

To these must be added Government stores, not returned by the Custom House.

The number of troops passing between Poonah and Bombay, both ways, during three years of war and three of peace, was on an average, if I remember it aright, about 8000 per annum.

the Malsej line, throughout its entire length from Callian, for several hundreds of miles, opens beautiful and fertile countries, in which no main roads exist. He exclaims against the monopoly of a railway by the Malsej Ghaut, and yet proposes that the railway company should possess themselves of the Thul Ghaut tramway, in order "to secure to themselves the whole of the traffic" from the interior to Bombay. "Justice to the deserving tribe of brinjarries" is said to require that the Thul Ghaut road should be kept in full employ, and yet the railway company is to be encouraged by having all the Thul Ghaut trade, and a railway is to be carried across the Nizam's dominions, through the heart of the country which gives the brinjarries their chief occupation. A very singular theory is broached, of an ascent up a mountain of 930 feet high, which shall be so good as to make the road no worse than a plain to the cattle which travel on it, without remembering that if this be so, then, *à fortiori*, the ascent of the ghauts, instead of being a break in the line, ought to be no difficulty at all to locomotive engines. How far a careful application of general principles might have prevented the occurrence of these conflicting views, it is not for me to conjecture; but it is manifest that plans dependent on them need much further investigation.

It is necessary now to enter on a defence of the estimates of traffic made by me for the Great Indian Peninsula Railway Company, for Col. Grant says, at page 59, that I have estimated for too large a quantity of grain; and at page 98, that I have taken too much for salt; then doubting, at page 97, whether so great a part of the traffic reaches the table land as I have represented. He sets down 100,000 instead of 180,000 tons per annum for the probable traffic of the line at the passing of the ghauts. A very short answer might be given to these allegations; but since the amount of the traffic, and the returns to be expected from it, lead to practical questions beyond any adverted to in the arguments used against me, I willingly go further into the subject. A history of the

investigation into these subjects will, perhaps, put the facts in the fairest way.

Indian statistics, except of the most general kind, are not popular in England, and therefore not easy to be obtained. Hence in 1842 and 1843, I found great difficulty in obtaining any insight into the nature and extent of the commerce of Bombay. The favour, however, of Mr. Stikeman, Secretary of the India and China Association of London, at length placed in my hands the Reports of the Chamber of Commerce of Bombay, and the facts given in those documents, together with those quoted by Mr. G. Thompson (now M.P. for the Tower Hamlets), in his Lectures on India, and by Major-General Briggs, in his pamphlet on the Cotton Trade, supplied the basis of the first incomplete representations on the subject which I ventured to make.

In Bombay itself, after much inquiry, I found no better authority existed, or could be desired, on the subjects to which they relate, than the above-mentioned Reports, issued, as they are, on the joint authority of the Government and the Chamber of Commerce.

I was unwilling, however, to rely chiefly on these papers, lest confidence in the investigation and its results should be impaired in England, by a supposition that I was content with the first evidence I could get, which gave a favourable view of an undertaking which it was so much to my own interest should be set afloat. I hoped, therefore, that in the interior, I should meet with other sources of authentic information. The instructions given me in London assumed, as is commonly believed, that all, or nearly all, the traffic between the coast and the interior, passes by the Bhore and Thul Ghauts, and it was consequently supposed that to enumerate the transit at those points, would ascertain the facts we wanted. If the traffic had exclusively passed these two points, the circumstance would have been nearly useless; for no accounts had been taken at the Thul Ghaut; and the tolls at the Bhore Ghaut were farmed, and therefore afforded no satisfactory evidence of the actual amount of

traffic. I could have set traffic-takers on them, but the traffic varies too much with the season to permit any safe average to be drawn from that of a few weeks, or even months. Worse than this, I soon found reason to conclude that the traffic does not all, or nearly all, go by these ghauts. Brinjarries, for instance, will often go the extra nine miles by the Koosoor Ghaut, rather than pay the small toll on the Bhore Ghaut. I met multitudes of bullocks on the route of the Malsej Ghaut, some of which had come half way across the Peninsula, and heard of others on nearly all such ghauts to the north and south of it as are passable for pack cattle. I learned even, from official sources, that the price of salt rose considerably in one year in the valley in the upper country, through which the Bhore Ghaut runs, the carriers of it having deserted that route in consequence of a demand on them, lately set up, for payment for pasturing their cattle on the lands of the road-side villages; at the very same time salt was cheaper than usual in the next valley, or next but one, owing to the increased facilities for smuggling afforded by some local disturbances. These and other circumstances soon showed that every bullock track up the ghauts, and probably every foot track also, was more or less used for traffic with the coast; and that the quantity that passed the two ghauts which had been supposed to monopolize it, even if known, would afford no safe measure of the real amount of the total transit; and to be added to the impossibility of watching all the tracks over 70 miles of the wildest mountain frontier, was the fact that the preceding monsoon had failed, and that the consequent scantiness of crops had so disturbed commerce, and diverted it from its accustomed channels, that nothing certain could have been learned from the transactions of that particular year.

Disappointed thus in a mode of ascertaining the amount of the traffic to be expected, which would have been best in accordance with English practice, and therefore best understood and most relied on at home, I next hoped for information which would be authentic, although not recent, from the

accounts of the inland transit duties. These duties had then been abolished in the British territories several years, and Mr. Alexander Elphinston, then Collector of Poonah, placed the official documents relating to them in my hands, in their original Marathi; my native assistants, who spoke and wrote English besides their own language remarkably well, translated them, and I employed for their explanation a native who had been engaged in collecting the duties. But the accounts, singularly minute and curious in many respects, gave only amounts of money received, and not the quantities of goods which had passed: these amounts were under such heads as, sums received for "sheep and goats," "cattle," "weighed articles," "measured articles," "groceries," &c. I next inquired for the rules by which the duties were collected, but found that they varied, beyond classification, for each district, for different parts of the same district, for ghauts close to each other, for goods meant for consumption in a town, as distinguished from those passing through it, &c., &c. In fact, in the days of native rule, each farmer of the revenue had bought the duties of the Government for the best bargain he could make, and then varied his mode of collection, amount of demand, or plan of compositions and remissions, as he thought best suited his own interest, with more or less control from the distracted government, with regard to the facility or difficulty of passing or evading his district, and perhaps also with reference to the fleeting circumstances of the day. The shifting medley of rules thus produced seems to have been daguerrotyped for the use of our Government, in the form it happened to bear at the instant of our accession to power; and it appeared altogether beyond hope so to apply these diverse and often absurd regulations as to learn, from the sums received, the quantities of the traffic on which they had been realized. A subsequent attempt to lay down the amounts on a map, so as at least to indicate the chief routes of traffic, met with no better success. It should also be observed that according to universal testimony, the internal commerce of the country had largely increased in the seven years which had elapsed since the abolition of the duties: a native of commercial eminence

at Poonah, who had long contracted for transit duties under both the native and British Governments, told me that in his opinion this increase was 50 per cent.

Foiled thus as to facts to be gathered on the field, I had no resource left but a careful examination of such documentary evidence as I could procure, assisted by such observation of the country and people as would lead to a correct appreciation of the facts which the documents might supply. After some months spent in the interior, I, therefore, sat down in Bombay, and entered into correspondence with the chief officers of departments there; with the collectors of the various districts; with the residents at the courts of Hyderabad, Indore, and Nagpore; with the commissioner in Chota Nagpore; and, by permission of Gen. Fraser, with the brigadiers commanding at the several cantonments in the Nizam's dominions, and other British officers there; and with Capt. Meadows Taylor, managing the country of Shorapore. The ground thus covered extended from Malwa to the Kistna, and from the coast to Nagpore and Hyderabad. The subjects of correspondence were the price and consumption of salt, grain, iron, &c., the cost of carriage, the sources of supply, &c., &c. Prompt and ample information was given me in every quarter.

Striking facts, and evidences of a large but very scattered internal traffic, were elicited in the course of this correspondence. But again, classification of results, and the forming of general conclusions applicable to the purpose, seemed impracticable. Salt was always much dearer in the interior than at the coast, and commonly dearer as it was carried farther; but not so uniformly as to afford a general rule. Iron is consumed, even for agricultural purposes, in only one hundredth of the quantities consumed in the cultivation of the same area of land in England; yet evidently not through dearness of the iron, but through want of skill and inducement to use it;—and so of other things. Much was learned, but nothing could be systematized.

One more attempt may be noticed for the importance of its subject, although it was but partially successful: it related to

the trade in the various kinds of grain. Difference of price being the moving power of commerce, it occurred to me that simultaneous prices of grains in various places would show where there had been a trade in them, or would have been had sufficient means of transit existed. To obtain the facts, the Government procured from Guzerat and some other quarters the periodical prices there, and my correspondence, already established, sufficed for the rest. The prices thus collected were reduced from their barbarous diversity of weights, measures, and monies to the standard of pence per ton; and the tables formed of the results showed that, at the proposed railway charge of 2½*d.* per ton per mile as far as the railway was available, and at the known rates of sea and land carriage for the rest of each journey, a large trade in grain would always have existed; but as this mode of investigation afforded no clue to the quantity of grain to be carried, it furnished no figure for the estimates; and the result could only be used in the way of a very indistinct though forcible confirmation of our prospects.

The reports of the Chamber of Commerce, therefore, still remained our principal source of information for the chief transit of ordinary commerce; to those it was necessary to add authentic facts as to the quantity of salt to be carried into the interior; and there were minor matters of traffic not to be omitted. Each of these requires notice.

The first of these, is the printed series of annual "Reports of the Commerce of Bombay, with tables showing the extent of trade carried on with each country and state. Compiled from official returns, under the joint direction of the Reporter-General on External Commerce, and the Committee of the Chamber of Commerce. The series commences with the year 1838-9, that which followed the abolition of the transit duties in the Presidency of Bombay: the last available report was that of 1843-44, some cause of delay having prevented the publication in time of that of the following year. The six years thus combined, afforded an average, which avoided the chance of relying on an unusually prosperous season. These

accounts also necessarily had the advantage of being perfectly free from the possibility of suspicion that they had been warped to favour the railway. The commerce of Bombay is given in these reports, not only in gross, but under the heads of the various countries with which it is carried on, and in detail under each of these heads; and as goods passing between the neighbouring continental ports of the Concan and Bombay, are subject to the surveillance of the customs, and pay, or did pay duty, just as though they came from a foreign state, a title is set apart for that commerce; and that part of the report, with a correction to be named, supplied the amount of goods to be carried by railway, so far as it could be ascertained from these authoritative public documents. To obtain the weight, however, in all cases (for many kinds of goods are given in quantities or values, and not weights), some pains and inquiry were requisite, in which Mr. Glass, then Collector of Customs and Reporter-General, as well as several merchants, very kindly assisted me. The results are given in the "Report, Maps, and Papers" of the Great Indian Peninsula Railway Company, where each year's traffic in each article is given in columns, as well as the average of the whole: a preliminary edition of these papers was printed in Bombay before I left, and copies were sent to members and chief officers of the Government, and other well-informed and influential persons in and out of office, in various parts of India.

The correction spoken of above is this—the term "Concan" is applied in the proceedings of the Government, and in the above-mentioned reports of the Chamber of Commerce, to the country extending from Omergaum to Malwan, a distance of more than four degrees of latitude; and it was clear that it was only part of the traffic which passed through the twenty little ports of this district, that could be relied on for coming to the railway. But from a table sent me by Mr. Montgomerie, who had charge of these ports, and which gave the customs of each port for two years, but not the particulars of traffic, it appeared that by far the greater part of the commerce passed through

those situated in the near vicinity of Bombay, and therefore of the railway, and only one-fourth of the whole by way of the more distant places. It was therefore determined to take three-fourths of the traffic entered as going to the Continent under the head of Concan, for that portion of it which would come to the railway. This Col. Grant has mistaken for a supposition that only three-fourths of the calculated traffic will pass beyond the ghauts,—a question to which I will presently advert. The traffic exhibited by the reports is 108,706 tons per annum, on the average of six years; three-fourths of which, or 81,530 tons, is the amount put down under this head in the traffic estimates.

All this traffic, I believe, will go beyond, or be received from beyond, the ghauts; or, what comes to the same thing, as much will be taken up in the Concan to be carried into the interior as will be set down there, having been brought from Bombay; and so also in the other direction: for the peculiar growth of the Concan is rice, of which much is consumed in the Deccan by the upper classes, and, to a less extent, by others; although comparatively little is grown there. A traffic in this article does exist, but it was not found possible to ascertain its amount; it is therefore left to compensate, as it amply may, for the traffic of the Concan, dropped or taken up short. This consideration leaves to us untouched, in effect, the weight taken up or set down at Bombay, as that to be also carried across the ghauts.

Amongst the items of the returns of the Chamber of Commerce is that of grain; it stands, on the average of six years, at a figure of 55,761 tons. To this amount Col. Grant objects that it is nearly that of the consumption of the entire human population of Bombay. I believe it would not be difficult to show that that consumption must be nearly twice as much; but whether so or not, I have given no estimated or conjectural figure for this item, but the actual average import of grain to Bombay, through the ports of the Concan, as stated on official authority. It is objected, moreover, that this grain is chiefly

rice grown in the Concan, and therefore not likely to be carried far, if at all, by railway; inquiry, however, satisfied me that this is not the fact; and I believe it will be found that the Concan contributes much less to the consumption of Bombay than might be expected.

The cattle which come to the coast for salt bring grain from the centre of the Peninsula, when difference of price permits, and it is often to be met with in transit on most of the ghauts practicable for cattle.

The last-mentioned question, that is, whether the calculated traffic will be carried on only part of the line, or to the extremities of it, attaches to the whole, as well as to the trade in grain. The answer is this,—that the extensive correspondence before-mentioned, as well as facts learned from other quarters, showed that the commerce of Bombay spreads itself all over the interior, although but in small quantities anywhere: it is found from Oujein in Malwa, to Kurnool on the Kistna, and eastward to Hyderabad and Nagpoor. Now, if this immense area be compared with the small extent of country actually traversed by the railway, even when it has attained a length of 200 miles, and has crossed all the ghaut country, and if it be also remembered that these mountainous districts are not more populous than those beyond them, it will easily be seen that any traffic which can be left behind at places near Bombay, must amount to a very small proportion of the whole, and may easily be compensated by the local traffic to which I have already adverted.

It is also important to remark that the descent of the ghauts, and the journey through the Concan—tracts so different in surface and climate to the interior—are only undertaken by the Deccan merchant and carrier with regret, and are submitted to only as unavoidable parts of his entire undertaking. He would gladly be relieved of them; for five times as many bullocks die here as on the rest of his journey, and he himself feels that the air is not that of the dry and elevated regions he has left. If, therefore, he could sell or deliver his grain or

cotton, and obtain his salt, metals, European goods, spices, &c. at depots above the ghauts, making his journeys shorter and oftener, he would gladly conform to and promote the change. To obtain this great advantage, however, the line must reach the level countries beyond the rough mountain tracts about the ghauts.

Col. Grant objects, page 59, that "of the imports and exports from the Concan, those from Panwell are included, which amount to seven-sixteenths of the whole traffic, but very little of which will ever find its way to the proposed rail by the Malsej Ghaut, as will hereafter be shown." I have been so unfortunate as to overlook the proof here promised, if it be in the book, and can therefore answer only on my own suggestion. If the line by the Bhore Ghaut is to come to Tannah (and I apprehend it must do so), then the fact of any part of the present traffic coming to Panwell tells nothing for or against either the Bhore or Malsej Ghaut, Tannah being common to both lines.

The practical questions, however, really are—where does the traffic originate? to what points is it to be carried? and what are the best lines between these points? I shall venture to say, not without inquiry, that much the greater part of the Panwell traffic originates far to the eastward of Poonah; and it is plain that when that traffic, in coming westward, has reached a point near to the junction of the Moota Moola with the Beema, it may nearly as well go to Tannah by the Malsej as by the Bhore Ghaut, and much better if a railway has already been made to Alleh for other reasons. No doubt, indeed, for all the traffic which originates on the line between Poonah and the sea, Panwell would be preferred, except in the rains; but this small portion of the whole traffic has not been taken into account; and it has already the accommodation of a very good road.

These various considerations induce me still to adhere to the opinion I originally formed, namely, that the amount deduced, as above mentioned, from the reports of the Chamber of Commerce of Bombay, is that which may safely be relied on as

the least amount of general goods' traffic of kinds which have paid duty, that will be carried on the railway from Bombay, to the extremities of the surveyed portions of the lines beyond the ghauts.

The amount of salt to be carried is the next subject of investigation. This article, of indispensable necessity to every class of the population, is produced, in anything like purity and quantity, only on the sea coast; and large numbers of bullocks are brought down from the interior to the sea for its conveyance, whether or no grain, or other goods, happen to be available for a profit on the coastward journey. The small quantities of impure salts, which, in the interior, are made to stand in place of sea salt, only serve to show an urgent need of the article, without materially diminishing the demand for it. Salt of some kind, is, in some places, got from old walls; in others, earth is washed for the sake of some saline particles it contains; and, in Berar, an impure carbonate of soda is obtained from brine drawn, with most severe human labour, from wells 130 feet deep. The main source of supply, however, is the sea; the rest are trifles, which the means of cheap and ready transit must quickly put out of use.

The course of inquiry was this: by questions to natives under a great variety of circumstances; by written interrogatories to native civil officers in different districts; by the investigations of British officers at various cantonments; by the regulations for the victualling of the native army; and by numerous well-ascertained cases of the use of salt by natives in Bombay—a collection of instances was formed, which showed that the consumption was not less than 16 lbs. per head, per annum. A return, to be mentioned just now, as well as facts elicited by other inquiries, showed to what distance, in various directions, the salt of the western coast was carried from the neighbourhood of Bombay before it was met by that from Bengal, from the Sambhur Lake, and from Madras. The four angles of the area so ascertained to be supplied were placed approximatively at Bombay; at Oujein, in Malwa; at Kyragurgh, to the east-

ward of Nagpoor; and at Kurnool; the quadrangular figure thus formed has an area of 112,061 square miles. The population of this area was estimated, on grounds not very precise, but still not without evidence, at 100 per square mile. From the figures thus obtained, it resulted, by calculation, that the quantity of salt to be carried by the railway would amount to 80,000 tons per annum.

Soon after the investigation in this form was concluded, the kindness of Mr. Montgomerie, collector of the salt duties, put into my hands a very complete account of the salt manufacture of the western coast, from the north of the Runn, in Kattywur, to Goa. This document was derived from official sources, as to the quantity made at each place; and it gave, from statements made by the wandering carriers, the places in the interior to which the salt of each point on the coast was conveyed. Other less reliable particulars were added from the same informants, which, however, did not immediately affect the inquiry. One of my assistants transferred these statements to a map, and thus showed that the area previously described from other information, was in fact supplied from points between Surat and Sanksee, to the amount of 64,629 tons per annum, and, for the most part, from works in the vicinity of Bombay. Some salt, indeed, consumed at a few places within the boundary above described, was obtained from works north of Surat, or south of Goa; but it was also clear, that salt carried by the railway would be cheaper at those places, than if obtained direct from the coast. Considering, then, that the quantities taken from points distant from Bombay was small; that the brinjaries who carried it had little or no inducement to cross the wild jungles of the northern Concan, if they could obtain salt above the ghauts; and that some was supplied from other sources, which I could not well estimate, but which would be superseded by the railway, —I concluded that I might safely retain the original estimate of 80,000 tons per annum, although it did exceed, by about one-fourth, the quantity represented to be carried inland from the particular part of the coast which I have specified; and I was

further induced to this by believing that increased facility and cheapness of supply, would amply compensate for any possible present error in the estimate.

These two items, namely, 80,000 tons of trade reported by the Custom House and commercial authorities, and 80,000 tons of salt, cover 160,000 out of the 180,000 tons on which I calculated for the traffic of the railway. I will not lengthen these remarks by observations on the remaining 20,000 tons, further than to say that, except two very small items, they are derived from official authority, such deductions being made from the official statements, as circumstances seemed, in one or two cases, to require.

Local traffic-taking in the island of Bombay was not neglected; but the results, although they exhibited extremely large numbers of passengers, and quantities of goods, did not seem applicable to the main questions connected with the long line which were then exclusively under investigation; they were afterwards of service in elucidating the prospects of the railway, when proposed to be carried no farther than Callian.

With this care in the investigation, I should have had little difficulty in avowing a full conviction that 180,000 tons per annum of goods' traffic, would come upon the line, even if no reserve of facts had existed to compensate for possible error. But it had to be remembered that this was the actually existing traffic, not the traffic taken with the increase invariably following the establishment of improved means of transit, and likely to follow in greater proportion in India (as it had done even on the opening of inferior common roads) than perhaps anywhere else in the world: we had also the passenger traffic in reserve, which would bring its profit, whether little or much, to contribute to the covering of error; and the internal traffic of the country, perhaps as great as the coast traffic, was left altogether untouched. I felt, therefore, that I might, with the utmost confidence, say that 180,000 tons of goods per annum was the smallest amount of traffic that a cautious and even scrupulous calculation of the prospects of the undertaking ought to assume;

and in this opinion I believe I was fully joined by the commercial members of the Board in Bombay, whose attention was particularly turned to these subjects.

The remaining question is that of the rate of charge. Here, as I have already remarked, Col. Grant falls into the error of supposing that $2\frac{3}{4}d.$ per ton per mile is a necessary charge; but it is only a prudent one, and probably will be much reduced in time, even in the interest of the railway company itself. The probable cost to the railway company of mere transit, I have shown¹ to be not quite $\frac{1}{2}d.$ per ton per mile; the total cost—management, repairs of railway, renewals, and everything included—would probably be not quite $1d.$ What the addition to the cost should be to realize the greatest profit, there are not yet known facts to determine; I suspect, as I have said, that the most beneficial charge will be $2d.$ per ton per mile, or less.

Meanwhile the practical question is,—at what charge can the railway safely begin to work? To determine this, I collected, as is known, a large number of instances of charge by the present means of carriage², from which I concluded that the average of the present charge is about $4d.$ per ton per mile, in the rugged countries bordering the ghauts on both sides, and probably $3d.$ per ton per mile in the more level countries beyond. Every statement I obtained on this subject is in print, although extreme instances were left out of account in estimating the average; and the cost of carriage of cotton was particularly investigated, as not only affecting a most important branch of commerce, but as supplying facts which ranged over many circumstances and several different years. From all these statements, some referring to bullock carriage on long journeys in wild countries, others to short local traffic, and others to cart carriage on the well-bridged and metalled road between Panwell and Poonah, it was confidently concluded that $2\frac{3}{4}d.$ per ton per mile would

¹ Page 295.

² Report, Maps, and Papers of the Great Indian Peninsula Railway Company, p. 49, &c.

afford such advantages to the people, even in direct money saving, as would bring to the railway the full calculated amount of traffic.

Looking merely to English experience, no doubt many will say that speed, safety, and certainty of action, would of themselves secure a preference to the railway independent of lower charge; looking, on the other hand, only to Indian experience, many will say that the natives of India care for no such advantages, and will give their preference only to the cheaper conveyance. Happily the facts do not require the settlement of this difference; the lower charge and the infinitely better conveyance are combined in the railway.

Col. Grant indeed objects, in substance, that the natives can lower their rates, because it does not cost them so much as they now charge. To this I have already answered that, with them, the question which determines their continuance in the business of carrying is not cost, but profit—whether in fact they can do no better elsewhere; and as no disturbing influences have now for a long time been operating, I conclude that the carriers of all kinds are doing only as well as their neighbours, and that any considerable lowering of charges would induce them to desert the occupation, or, more probably, lead them to desert the tracks which would compete with the railway, for the branch and extension lines which would concur with it. Particularly may we reckon on this collateral effect, when that of the railway itself would be to open markets for increased quantities of the produce which the land yearns to afford, and to raise which, and to bring it to the railway, additional labour could easily find employment.

To this answer I now add, that if, as calculated by Col. Grant, page 148, the prime cost of cart carriage on a good common road is as much as 1'9*d.* per ton per mile, for draught and cart wear only, then it is certain the native cannot for a moment compete with the railway, to which draught, cart wear, management, repair of roads, and the whole train of expenses up to dividends, but not including them, could not cost much more

than half that sum. The mere difference in cost between one kind of conveyance and the other would pay moderately good dividends, provided the quantity of traffic calculated on, 180,000 tons per annum, went over the line. As to a bullock draught on a tramroad, I need not revert again to that subject.

The only permanent advantage I can think of on the side of the common-road carrier is, that he would work with the energy and single-headedness of private enterprise. I admit the magnitude of the advantage; but as the costs of railway transit in India are computed from the actual results of English business worked under joint-stock management, this consideration is in fact taken into account.

It may, however, be added, that at first, while the native cart-man would be at home, the railway employés would be in a climate new and not favourable to them; but this disadvantage, which is largely allowed for in the comparative calculation already given, would be diminished every day, by the acclimatizing of European officers and servants, and the qualifying and incorporating of natives.

As to the estimates of cost both of construction and working, I believe them to represent the future as accurately as circumstances permit. Every care was taken to avoid error; the best understanding prevailed amongst those concerned, which led to the most effective co-operation in contributing to their accuracy; much information was afforded by experienced officers of the Government; and the rates of the Government were made a chief standard of comparison in forming them. Without stickling for details, I know not materially where to alter them. They have been examined and approved, both officially and extra-officially, by those most likely to afford a sound judgment on them; subsequent investigations and I believe actual contracts, both in Calcutta and Bombay, have gone below them; and Col. Grant has not impugned them, except in the case of the tunnels, and to his remarks on that subject I have replied. I shall, therefore, in some future discussions, take the estimates of cost as sufficiently established.

I believe I have now replied to every material argument of my respected opponent, and in them to every important objection from other quarters which I have met with. Having expressed my own earnest and carefully-formed convictions, I can only add an expression of my sincere wish that this discussion may lead to the discovery of the truth, whatever it may be, on practical subjects so important to the interests both of India and of England.

CHAPTER IX.

ARRANGEMENTS FOR THE PROSECUTION OF INDIAN PUBLIC WORKS, AND OF THE GREAT INDIAN PENINSULA RAILWAY IN PARTICULAR. INTEREST OF DIFFERENT CLASSES IN THE SUBJECT.

IF the vigorous extension of improved means of transit in India is invested with the importance which the arguments of the foregoing chapters assign to it, the conclusion cannot long remain an inert proposition ; neither the enterprise of some of our countrymen, nor the pressing interests of others, will long let it sleep. It is, therefore, of necessity that the question is asked, " What are the practical steps to be taken to realize the views, if sound, which this discussion has presented ? "

The three preceding chapters, together with the documents in the Appendix (to which, especially to Mr. Clark's report, I am anxious to call attention), will be found, I trust, to afford information which may lead at least to intelligent discussion of the local considerations which affect the route between Bombay and Central Peninsular India ; and since those chapters express the convictions which I formed in the course of a long, and, I believe, unprejudiced investigation, and to which I adhere only the more firmly from repeated examination, I believe that, for the purposes of argument, I may, without impropriety, assume to be true the statements and conclusions already adduced, so far as they affect present public questions. This assumption I extend, for the same reason, to the following estimate of the commercial profits of the lines I recommended,* if carried by the Malsej Ghaut to the furthest points surveyed. These results, however, must be

understood to apply to this line only, and not to any other, nor even to a modification of this, without further investigation. The great diversity of circumstances in different parts of India renders this a necessary precaution ; but it is by no means intended to be insinuated that other lines, well adapted both to public advantage and to private profit, may not be constructed in other parts of India, or even in the Presidency of Bombay.

Still stronger reasons for relying on the following conclusions may be drawn from the nature of the sources whence the evidence was derived, and from the publicity with which all the investigations were conducted. The sanction of Mr. R. Stephenson (given with a recommendation adopted in the final calculations) imparts value to the whole ; and if anything more were wanting to induce confidence, it would be found in the facts that the goods traffic only now existing is of two-thirds the value per mile per annum of the entire average traffic of all kinds on the English lines, developed and matured as it is ; that the passenger traffic was reserved to meet possible error ; and that all subsequent proceedings with respect to contracts for railways in India, have more than confirmed the representations of my colleagues and myself.

The results thus accredited are as follows: If the line cost 12,000*l.* per mile for its construction and furnishing—if the estimate of working expenses be not exceeded—and if the line carry only the existing amount of goods traffic, viz., 180,000 tons per annum, without any passengers, the balance applicable to dividend will be 11 per cent. per annum ; or otherwise, if the cost should reach to 15,000*l.* per mile, and the existing goods traffic should be doubled, still, however, without passengers, the profit available for dividend would be 18½ per cent. I propose in a farther argument to assume the probability that the undertaking, rightly managed, will pay 13 per cent.

But this assumption leads to the question, “ Why with such a prospect, so certified, has no greater progress been made with this and other Indian railways ? and why is there so little apparent likelihood of greater rapidity of progress in future ? ”

And here are opened questions which, I apprehend, future discussions on Indian railways cannot avoid.

The most conspicuous feature of the proceedings which have occupied the time from 1846 to the present, is the long-continued effort to obtain the guarantee of the East India Company for a minimum dividend, which was proposed first to be 4 per cent., and afterwards 5 per cent. per annum. This proposition and its adoption involved important principles, and draw after them important consequences.

This device was adopted as an obvious means of escape from the effects of the want of knowledge in England on Indian subjects: and certainly it was not easy, at the time, to determine whether the difficulty would be met better by supplying the requisite knowledge to, and exciting the requisite interest in, the public mind, or by resorting to the artificial means of counteracting the difficulty which might be afforded by a government guarantee. Events have led me to entertain an opinion that it would have required as little labour, expense, and delay, to indoctrinate the public to a sufficient extent to occasion the contribution of the requisite amount of capital, as it did to obtain the support afforded by the concession of the Government: and this is the more probable from the fact that the period of weakness and gloom which followed the terrible commercial panic of 1847, during which all progress towards a final settlement of the terms of the guarantee was suspended, might have been employed in diffusing information that would certainly have borne its fruit in the period of activity which, according to precedent, and from the operation of ordinary causes, in due time followed.

Be this, however, as it may, the first effect of the proposition for a guarantee, and of the urgency with which it was solicited, was to discredit, and to render worthless in public estimation, the evidence on which the intrinsic soundness and safety of the undertakings might have been demonstrated. Nobody would or did look at statements which the acts, though not the words, of the leaders of the Indian Railway Companies declared to be

insufficient for confidence: and this is the more remarkable from the fact that this disparaging supersession of the merits was not accompanied, at least in the case of the company with which I was connected, with one single attempt to show either the insufficiency of the evidence, or the inaccuracy of the conclusions. For all that has taken place, every word and figure as relating to the line extended beyond the Ghauts, stand untouched to this day; but they stand also without effect. Nor can we avoid remarking that while British capital embarks itself in foreign enterprises of all kinds, in every clime, on examination of and confidence in the merits, Indian railways almost alone have been suffered to risk their progress, and even their existence, exclusively on external considerations.

One consequence of this course was, that the possibility of proceeding with Indian railways was made to rest entirely on that of obtaining a Government guarantee; and long did it rest on this ground. It was only when interests which could not be disregarded were brought to speak out, that the scruples or the inertia of the Government (particularly of the Board of Control) was overcome. Another effect was to throw away the vigour and confidence which might have been derived from a wide-spread conviction of the intrinsic commercial safety of the undertakings.

The adoption of this course having operated thus vitally on the movements of the parties immediately interested in the undertakings, it is of no slight importance to consider what, on public grounds, are really the character and value of the principles involved in the grant of a Government guarantee of an annual return, whether of interest or dividend; and this inquiry is important, not so much for the sake of criticism on the past, when such a measure was a natural, though perhaps not, an unexceptionable, device, as with a view to the future — with a view to the influences which may operate in future in that great field of industry and enterprise, which the interests alike of India and of England require should be promptly and wisely occupied: and the prosecution of this

inquiry is strongly urged by the fact that the delays incurred in working the guarantee (conceded in the main in October, 1847, and definitively granted in June, 1848), are not less than were the delays in obtaining it. In the following remarks, principles are employed which I am known to have held from the beginning, although under the circumstances of the time, I exerted myself to the best of my ability, and I am told not without a due share of effect, in obtaining the guarantee which, as I have explained, had been made indispensable even to a commencement.

The grant of a guarantee by the East India Company, of a minimum annual return from a railway, involves practically an entire departure from the principles on which all modern legislation in respect of the trade and government of India have proceeded—except indeed the East India Company would have so far deviated from what is usual and proper in such arrangements, as to leave all management in the hands of the railway companies, and to charge themselves with making good all consequences. Notwithstanding the energy of their early enterprises, and the length of time during which they had possessed their exclusive privileges, it was found necessary gradually to weaken their hold on their law-made monopoly of commerce, and in the end to abolish altogether their right to trade, so long as they remain a government. Events have proved the soundness of the views on which this gradual but complete change was effected; and the commerce of India, which was dwindling and fitful in the hands of a giant corporation, invested with powers of political government, has increased manifold in the hands of a multitude of unfettered private traders, each devoted to his own business.

Whatever might be supposed to operate disadvantageously in the case of the East India Company while that body was sustaining the double character of a government and a trader, operates to the same effect on railway undertakings in India through the guarantee, and must so operate until any railway commenced under that arrangement shall have been constructed,

and shall have paid off by half the excess of profits above 5 per cent., the whole of the lien of the Government upon it. Whether the trading interest or risk of the Government bring into the affairs of such an undertaking the procrastinating complexity and stifling formality of all government proceedings, whether it substitute official supervision for the solicitude of ownership, or whether it endanger the reputation of the Government for impartiality amongst the interests it ought to protect, and over which it ought to adjudicate alike—every reason for which the trading privileges of the Company were abolished applies with equal truth, if not with equal force, to the guarantee and its attendant powers. It is worth while, however, to consider the subject somewhat more at length.

The main object for which a government is instituted—that object which if not, as I take it to be, its sole duty, is at least that which must be performed before all others, and, if needful, to the sacrifice of all others—is the preservation of right, and ultimately, in all cases, if necessary, the defence of right by force. From this arise several necessary conditions of its action, all of them incompatible with its inefficiency as an instrument of industrial enterprise. Amongst these seem to be the following: its organization must be complicated, its proceedings formal, and its system of responsibility rigid and precise, the control of the head being everywhere minute, complete, unimpaired, and commonly exercised previous to action; the time of its chiefs is necessarily fully occupied; its chiefs and agents, if they are fit for their own business, can have but little of the special adaptedness required by other pursuits; and its impartiality as an armed arbitrator ought to be beyond the possibility of influence.

The whole physical power of the community, in all its modes of action, including the deadliest, being committed to the direction of the Government, the most exact control by, and subordination to, that supreme authority, are requisite to prevent this tremendous power, in the hands of inferior agents, being turned against the rights it ought to protect; and so

much the more is this necessary as the Government has at the same time the absolute and unappealable determination both of private rights and of great public questions. Hence the rigidity of its control over the actions, and, to some extent, even the thoughts of its functionaries; and settled principles, which can only be debated a few times in a nation's history, control the Government itself. The safety of such an engine arises from the obedience of its parts to the few at its head, whose strength in turn lies in their conforming to the average impulses of their age and country. But this safety, indispensable before all other considerations, is purchased at the expense of so much efficiency as is lost by bringing down the actual efforts, and sometimes even the possible capabilities, of each man included in the organization to the measure prescribed by the movements and necessities of so vast and precise a combination;—just as a regiment must march only when it is ordered, and then can move only at the rate of the slowest man in it.

Accustomed as we are to the regularity of the movements of modern European governments, and especially of our own, it is not easy to realize the degree in which this severity of control is essential to the specific character and due action of a government and to our private safety. The governments of Asia, however, afford us ample illustration of the consequences of its absence. Under them every man who will, may be the head of an armed body of his own; and even the forces which should be those of the state are held together on principles which attach the men composing them much more to their immediate and individual leaders, than to the general interests and authorities of the nation. Hence, among other causes, the weakness—or the alternate weakness and fury—of the central power, and excesses at all the extremities.

Although it is in respect of the arrangements for the direct application of force, that the operation of this principle is most clearly seen, yet the principle itself, of necessity, pervades every department of law and government. The individual must conform to general rules, and superior dictation; and often even

the course, by which he does conform to them is itself prescribed and allotted, to the exclusion of the consideration of particular circumstances, or the exercise of his own judgment. By no other means can large states be regulated, whether in relation to the rights to be defined and protected, or the agencies employed to define and protect them. Nor does the mind itself escape the influence of this uniformity of treatment; the gifted few, indeed, may break bounds, or contrive to have their own way within them, and all may escape, at intervals, from the matters in respect to which they are regulated, to the more congenial pursuit of subjects in respect to which they are free; but, for the multitude, government—the determining from without of the course to be taken—implies, as far as it operates on them, the moulded conformity of the single mind.

But industrial affairs, such as occupy the bulk of mankind, cannot afford the waste consequent on this preciseness of control, neither are they consistent with submission to it; they meet at every turn with variations of circumstance, and emergencies of action, which are beyond the utmost power of foresight, and therefore of regulation, but which are evidently designed, and are eminently fitted to exercise and improve the powers of the individual man; if the individual man had no occupation but that in which he was ever obliged to wait for the word of command, the greatest part of his strength and time would evidently be lost, and the man would dwindle to a machine. To put an extreme case: what could be done by a gang of railway labourers, or by the hands in a cotton mill, or the clerks in a London bank, if every action through the day were regulated with the precision of the manual exercise? and what would be their value, *as men*, when their day's work was ended? What, indeed, would soldiers soon become, if even their ruled existence did not leave to them some matters in respect to which they might exercise and follow their own thoughts?

No doubt every large organization is, in some respects, and to some extent, under the same necessity as a government to adopt general regulations, and precise control; and hence, large

joint-stock associations partake, although in a lower degree, of the same disadvantages, in comparison with private effort, which inevitably attend the proceedings of every effective government. Nor is it always that in these associations, the principles on which depend the reconciling of the highest development of individual freedom and capability, with unity of effort in relation to the common object, are so understood or regarded, as to reduce to its practicable minimum the apparent incompatibility of these equally essential conditions of success. But, after all the failings, moral and administrative, of other associations, there are great distinctions, which make a peculiar case of that of the government; and the vastness of the numbers with which it has to deal, and the power essential to it of enforcing its determinations, seem to involve consequences which will always render its proceedings far more wasteful and inefficient than those of other associations (except in instances of gross misconduct), and will ever render its organization pre-eminently unfit as an instrument of industrial enterprise.

A government of almost any country, but particularly of a large one, has a still further disadvantage in the fact, that the time and mental powers of its chiefs must ever be fully taxed by the proper duties of their office; and yet all proceedings must wait for them. We need only the revelations of the Committee on Official Salaries to show us how the members of her Majesty's ministry are occupied; nor are the Chairman, and Deputy-Chairman of the East India Company, or the heads of government in India, much less severely worked. To render industrial undertakings dependent on the few odd half-hours which these overburdened authorities may be able, at uncertain times, to bestow on them, is to incur disappointment, which is deserved in proportion to the facility and certainty of foreseeing it. It removes the difficulty but one stage, and that attended with increasing objections, to say, that much which goes to the world in the names of chiefs, is really the work of those below them. A subject, artificially tacked to the true business of a

government, is lost amidst the weightier matters which every day presents for urgent dispatch.

Want of time, and full occupation with a very different class of subjects, account for the absence of that special aptness for industrial affairs which the members and officers of a government, fit for their own duties, and well fulfilling them, must necessarily exhibit—a special aptness which it needs the entire devotedness of other men to acquire. If the best mode of supplying London with water were referred to a professor of Hebrew or of divinity we should see at once the absurdity of the step; but we do not hesitate to refer industrial undertakings, not merely in their rights, but in their management and profits, to the members or officers of a government, who are necessarily as far removed as those professors from all probability of having either the knowledge or the skill required for the business. If the construction of the Thames Tunnel, the Liverpool and Manchester Railway, or the Britannia Bridge, had been submitted for determination to a Master in Chancery, we should have expected just what has happened in the case of Indian railways, and for much the same reasons. Far is this from being an imputation on the talent, integrity, public spirit, or devotedness to their duties, of any government or officers who may fail in so uncongenial a task; the better they fulfil their own duties, the worse in the same degree do they appear to be qualified for this.

To these difficulties we have to add that of the Government becoming not an impartial judge amongst all rights. Once pledged and interested, how is it to look with equal favour on that which may seem, without touching the rights of its adopted, to threaten its profits? And yet how often does it happen, that either others must not be permitted to jostle, in fair rivalry, with those whom the Government had promised to favour, and sometimes with the establishments of the Government itself, or there must be a denial of the plainest rights of enterprise, and the sacrifice of public interests, as seen by the

better light of new events¹. In truth, as soon as a government ceases to confine itself to rights, and begins to meddle with profits, it commonly loses the reputation, the coolness and the impartiality, of an umpire, and becomes involved as party, either by interest or feeling, in the complicated questions to which rivalry of enterprise always gives birth.

If these practical disadvantages attach themselves to Government management and control, when even the same persons remain in office, what may they not become when changes take place—changes which originate, perhaps, as far as the limits of human pursuits permit, from the industrial objects and interests affected by them? A railway or a dock was, say yesterday, in the hands of a government, who had adopted, in respect of it, a certain set of views, and a corresponding course of policy; to-day anything, from a backstair intrigue or a blunder of some far-off ambassador or consul, to a rejection of the budget, turns out the ministry; the railway or dock must

¹ A remarkable instance of the effect of this tendency is given in the following extract, from the Reports and Documents, of 1836, page 4. It will be observed, that the recommendation of the Bombay Government of that day was overruled by the Court of Directors, of whose letter, dated 1st of January, 1789, the following is part:

“As the standard you mention to have adopted (that of the compression of cotton for shipment), very considerably exceeds the measurement stated in our former letter, which we have reason to think is tolerably accurate, we must desire that this subject may be again taken under consideration, and that you ascertain, with the utmost degree of care and attention, the smallest possible dimensions to which a bale of cotton is capable of being compressed by the Company's screws; and if, after so doing, it shall appear that the new standard dimensions are not capable of being diminished, you must endeavour to ascertain whether the cause is to be attributed to any defect in the principle on which the Company's screws are constructed, or whether they require the aid of any mechanical improvements, to give them the powers which they are not at present possessed of.

“If individuals, either by superior industry, or the application of powers better adapted to the end proposed, have been enabled to accomplish so material an advantage as the difference thus gained in point of tonnage, provided there were no other objections to the measure, this alone would be sufficient to prevent our complying with the request contained in your public letter, for the suppressing of private screws, and confining the merchants to the use of the Company's screws only.”

wait until it can be attended to, and then it is set a-going again on a new set of notions. How, in the face of these risks, that unity and persistence of purpose, that consistency of detail, that harmony of operation, and that unchilled interest in the object, can be maintained, which are essential to industrial success, seems as much past our power to conjecture, as it is past that of experience and examples to show.

The answer commonly given to such remarks as the above, is, "constitute a government department for the purpose." But here, again, we have only a choice of evils, and those of both sides inadmissible. If such a department be under the effective control of the heads of the government, it must partake of all the disadvantages which have already been described—the delays and the incertitude of government action; nor does it seem possible that the most gigantic and unwearied intellects, occupied imperatively with the multifarious concerns of a diligent and effective government, should preserve continuity of recollection and permanence of purpose enough, to dictate with effect even the general measures to be taken in the various stages of industrial affairs. If, on the other hand, the department be *not* so effectively controlled, the whole amounts to nothing more than giving the name, weight, and authority of government to men who, with less than ordinary inducements to acquire qualifications, or make efforts, are placed exactly in a position to have everything their own way. It is in these by-nooks of organization, where some extraneous object is hung on to the great legitimate business of the political system, that official incompetence or indifference is most likely to nestle itself, and where it snugly holds in defiance that responsibility, which can only reach it by first tearing away the much-abused screen of "the government." And notwithstanding a few splendid examples to the contrary, (and the services of the East India Company at home and abroad, have supplied some of the finest of them,) it is still true in the general, that in corners of this kind are to be found the matters in which the public interests have been least consulted, worst served, and most

neglected: they have been placed, to no compensating purpose, out of the light and air which should have stimulated and nourished them. Even where the business has happily, for a time, fallen into hands of unusual excellence, how often has it been seen that the zeal and intelligence of the subordinate and semi-detached department have been rendered useless by the want of time, or attention, or means on the part of the supreme authorities, or by the overturning and overwhelming necessities of the system with which it was so artificially linked.

No doubt, in spite of all past failures of governments in industrial affairs, there are those in every generation who fondly go over the old ground again: they believe that the fault was in the men who happened to have these matters in hand—that the failure, notwithstanding its universality, was that of the incidents, and not of the principles—and they fully believe, as they really intend, that they themselves shall do better. Every man has started with this purpose and hope; but almost every man who has so started, even if he has himself fulfilled his own hope, has had successors who have come down to the old level, and have furnished new specimens of all old failings. The fault seems to be that we commit such affairs to an agency established for another purpose, and which, if fit for its own objects, is altogether unfit by its very constitution for this.

It is scarcely necessary to lengthen these remarks by dilating on the contrast afforded by private enterprise. The energy of single characters, in which, unshorn, lies its strength—the wary alacrity with which its objects are pursued and its opportunities seized—its freedom and care in selecting and changing its agents—its exemption from trammels imposed by other duties and relations—its less wide-spread risks of extraneous obstruction—its simplicity of purpose and unity of plan—the caution with which each of its minor operations is made to fall into system with all the rest—and its deeply-felt interest in the result, give it a character altogether different from that of government management of the like affairs, and leave it to be regretted that no mode of association has yet been devised by

which the great undertakings of our age can be made to participate more fully in its advantages.

These remarks might receive ample support from instances drawn from every country whose industrial history is accessible to examination; a very few derived from nations and matters connected with the principal objects of this inquiry must suffice.

In 1830 the Government of Calcutta sent to its officer at Etawah and Calpee a saw gin, probably American, which is said to have worked admirably at Calcutta. Arriving at the end of February, it was reported in June to be defective; all the defect seems to have been that the handle or winch for turning it was not sent with it, and the officer could not find out how to put it in motion, and this, notwithstanding the interest which other facts show he took in the matter¹. Is it likely that private persons, attentive to their own affairs and troubled with no other, should have so rendered abortive a proceeding which they believed to be important? Would any such persons have relied on an agency so occupied as to be four months in discovering and reporting such a defect, or on an agent who, excellent in his own business, was so little likely to understand this?

Mr. Price, one of the American cotton planters, in the service of the Government, who was stationed at Dacca in 1845, wanted a horse for himself, bullocks for his ploughs, and an elephant or two, to enable him to get rid of the wild hogs and leopards which were ravaging the farm. For these he had to write to the Revenue Commissioner, and he to the Government; and so months were lost, if indeed he ever obtained all these matters, which does not appear. In January he had applied for labourers from another part of the Presidency; and in June, when he most wanted them, and much should already have been done, he had not received them².

The American planters located in Bundelcund and Agra, of course wanted bullocks; an order to supply them from Goruck-

¹ Reports and Documents of 1836, pp. 194 and 201.

² Return of 1847, pp. 292, &c.

pore, 200 miles distant, was given after the business had passed through the usual circuitry of Government boards and offices. When the animals arrived they were too late for the season, and moreover were worthless—the year was lost

Cotton presses were wanted. Mr. Finnie says:—"The presses which have been sent out here have long since been reported useless, and yet no measures have been taken to procure others. The defect is want of power, want of speed, and, in a word, want of everything a press ought to possess." In the same document this planter remarks, that "the necessity of a constant reference to Government upon all matters of detail, has hitherto greatly impeded the operations, and has occasioned the utter loss of the cotton season which has just passed."²

Instances like these might easily be drawn from almost every extra department of every Government, the published cotton proceedings of the East India Company for 50 years supplying their share of them; but since these occurrences, so closely connected with individuals, might produce an impression different from that which it seems to me the principle in which they originate would alone justify, I leave the suggestion to be applied by each reader for himself to the cases of this kind, which are constantly occurring.

An illustration free from this objection is supplied by the well-known state of the long-agitated subject of roads, tanks, and other public improvements in India. Proposals, estimates, reports, surveys, references, consultations, documents, plans, and entreaties, of every form, have accumulated for the last half century, until probably more has been done than would suffice for laying out and estimating for a great trunk system of railways for all India; and yet the cry is, "we have no roads." Line after line—line upon line—line instead of line—of common roads, have been surveyed, recommended, and discussed for all parts of India, and yet nothing is done. Now, unless

¹ Return of 1847, p. 90.

² Return of 1847, p. 241.

we are prepared to adopt the monstrous and incredible theory, that a conspiracy has been kept on foot for 50 years, to prevent territorial improvements in India—a conspiracy embracing Presidents of the Board of Control, East India Directors, Governors-General, Governors and Members of Council in India, officers of all services and all ranks at home and abroad—we must conclude that it is some overruling cause which has operated on all persons, in all times, and under all circumstances, and not the crotchets or delinquencies of individual rulers or officers, which has produced so universal and uniform an effect.

Here we have zeal, capability, and actual exertion in the lower part of the organization, held down by the over-occupation of the upper, and by the necessities of the entire system. Officers full of anxiety for the welfare of the country sigh over the postponement of works long ago proposed and all but approved; while they to whom the final sanction belongs, find every day something else to do which cannot be postponed, or they know too well that the treasury, in the face of still more imperative obligations, cannot spare the present expense of these works, however important to the public, or reproductive eventually to the state. Some even of the works from which the Government has derived credit, were made almost in spite of the supreme authorities; as for instance the embankment over the strait at Sion, for which the then Governor of Bombay received a severe lecture from England, and the Bhoze Ghaut road, which Sir John Malcolm undertook in excess of his powers. An obvious inference from these facts is, that the energy of the inferior parts of such a system, as far as it is employed in extraneous matters, runs in great part to waste; and here the evil exhibits itself in a greater degree than usual, because, on the one hand, the Government is bound by more than usual stringency of circumstances to confine itself to primary objects, and on the other, the officers of the East India Company, executing civil duties, being more widely scattered than any other, and therefore more at liberty, and compelled to

cultivate and rely on their own resources, often become remarkable for high intelligence and administrative efficiency. To these contrasted circumstances may we attribute the piles of able, praiseworthy, useless plans at the India House. There may be much in those accumulations which on judicious examination would be rejected; the adoption of the worst designs amongst them, however, would often have been less really wasteful than doing nothing, if overruling necessities had not prevented it; and, after all deductions, it is not too much to say that the men who devised those plans would by this time have changed the face of India, had they happily been members of a different and independent organization.

This want of effect in industrial affairs is exhibited in the same way by the Government of France; and the issue has remained the same whether that Government were imperial, royal, or republican. Up to the period of the extension of our turnpike system early in last century, the roads of France and England were equally and execrably bad. France placed the roads in the hands of the Government, and gained by the measure a few great lines, mostly of no extraordinary excellence, the branch and local routes remaining to the present about as bad as ever. England adopted the system of local management, and payment for the use of the road, and so covered the land with roads which were the admiration of Europe. So also the public conveyances on those roads in the two countries, there very much in the hands of the Government, here the offspring of private enterprise, marked as clearly the character of the respective systems. France, until of late years, produced the finest treatises on bridge-building; England built the best bridges. The acquisition and improvement of the science simply as it depended on the intellect was within the reach of individual officers, and in this the French excelled; opportunities of applying that science so as to acquire the practical accuracy requisite to successful effect were made few and insufficient by being left to the mercy of all imaginable public events, and of the opinions, convenience, and necessities of the

ruling powers. England, with less of such science as depends on the cultivation of formality and precision of thought by a few persons, afforded through a freer organization ampler opportunities of practice. France accordingly got books, and England bridges: England now gets both. France derived her railway system from England; she acquired it through her Government with extreme slowness; it was made for her in great part by English skill, and it is still insufficient. Why should we import the principles which give such results into India?

In England, too, those departments even of the proper business of the Government, which approach in nature to industrial or mercantile undertakings, seem to suffer in the same degree from the nature of the system to which they are attached. To mention the Dockyards, the Woods and Forests, and the designing and building of steam-ships, is enough to indicate modern and striking instances of the operation of a principle, which, to a greater or less extent, seems to affect all times, countries, and departments. Where, indeed, the young zeal of a recently-formed establishment, whose object is a matter of present interest to the Government or the public, really imparts to government business the energy of private character, and the attendant circumstances give it unusual motives and freedom, a different result is commonly apparent, the result of a really different case; but, taking the average state of such establishments, the eventual consequence of their inevitable conditions of existence, it seems very unlikely, as, indeed, experience also shows, that in any country, or under any Government, a government establishment can be found which will bear comparison with private concerns of the same kind, if the latter have equal circumstances, and fair play in the competition. To suppose, however, that all government officers are so universally incompetent and dishonest as to account for this universal result, seems to me to be a most gratuitous as well as unjust assumption; and, by stopping short with such a solution, we miss, I believe, some truths of great practical value.

The contrast between the conduct of the Governments of British India and of the United States affords an important illustration of the effects of these principles in another view. The first-named Government is tardy, almost beyond the endurance of public patience, in everything relating to public improvements; the last is as much distinguished by eager and energetic rapidity. Without becoming in any degree an apologist of our Indian Government, I shall venture to suggest a mode of accounting for the difference, which does not begin by assuming that the rulers of India are less solicitous for the prosperity of one country than the Governments of America are for that of the other.

The Government of India is bound, by the inexorable circumstances of its situation, to the almost exclusive performance of its main or sole duty, the maintenance of right by force. Itself physically helpless, but morally strong, it is a foreign arbiter amongst strange and diverse populations, who have not before been ruled in common for the maintenance of peace as the prime object; it cannot safely favour or neglect any of these to the prejudice of others, or to the violation of the general feeling of justice; private safety calls, from social or moral causes, for equal or greater care; its own power of attention is not more than enough for the accomplishment of its one vast object; the sums it can draw from the people, in the form of taxes, are not more than enough for the cost of it; its personal means of information and action must be chiefly drawn from and have the quality of the population of India itself; its performance of this essential duty is judged of by the more elevated and exacting standard of English public opinion, and a failure in this duty would not be compensated, in English estimation, by success, however brilliant in other affairs. To this object, then, its organization and habits are rigorously adapted, to the exclusion of fitness for any other. As far as its own action is concerned, it can do anything within its wont and business as rapidly as any other Government, whether it be the appointment of a native magistrate's clerk, or the assembling of an army of 100,000 men; but for all beyond its main object it seems to forget that time

fies at all. Suttee, Thuggee, and human sacrifices, ancient and deeply-rooted superstitions, murderous usages within its duty, were suppressed, when Government once set about it, in less time than it took to open the East to steamers. It can annex a quarrelsome kingdom in three months; but it takes three years to consider a crane or a jetty; six years to think of a common road; and a generation, if let alone, to consent to a railway. Whatever it may profess, wish, or attempt, it cannot afford to look to profits; it is bound, not indeed, by avowed principles, nor even perhaps consciously to itself, but by imperative facts, to look only to rights. Hence the spectacle it exhibits of extraordinary torpor in respect of public improvements, notwithstanding the proved and admitted profitableness of every step it might take in promoting them. But, after all failings, blunders, and disgraceful misdoings, it must still be said that it nobly keeps the peace where it was rarely kept before.

The Governments of the United States of America are over a people who keep the peace, as far as it is kept, very much by themselves; but they make every citizen of the state, whether he will or no, a partner in banks, roads, canals, and railways; no principle restrains them from doing the same with anything else which could be brought within the grasp of government management, from the building of steam-ships to the dipping of rush-lights. They are involved with all interests, and are therefore often feeble in respect of rights. They use the powers of the state for the fostering of enterprise, and so become entangled in its countless rivalries. They found a new state every year; but repudiation disgraces their finance; brutal violence, lynch law, and slavery shame alike their morals and their judicatures; while private armaments on speculation nestle uninterrupted in their ports, and the reply to the indignant communities attacked by them, is, "We cannot help it." The people afford examples of enterprise and progress such as the world has rarely, if ever, seen before; but the Governments cannot answer to other Governments, or even to their own people, for the accomplishment of some of their plainest responsibilities.

•One Government, then, that of India, strong and stiff by the necessities of its duties and of its own position, is proved in practice to be utterly unfit as an instrument of industrial enterprise ; the others, those of the United States, flexible and agile enough to be made instruments of enterprise, fail to fulfil some of the essential duties of government.

To this contrast of principles and consequences may be added an expression of regret as to America, and of caution as to India. Of all people, the self-relying Americans have the least pretence for needing to pursue so artificial and detrimental a course. If every Government in the United States were to sever all connection with engagements entered into for profit, provided only that it strictly, impartially, and diligently attended upon rights, it can hardly be believed that one stroke less would be struck, one dollar less turned, or one mouth less fed. If so, what do the Americans gain by debilitating their Governments? On the other hand, what would be gained by involving the Government of India extensively with industrial interests? What, indeed, might not be lost by relaxing that bond which is the only reliance to which the people have yet been accustomed for the preservation of general and local peace—for the preservation of that peace which is the one indispensable precursor of all other good?

One of the consequences of these views, if they be as well founded as I believe they are, seems to me to be this—that when the Indian authorities are charged by some with spending so little out of the taxes on public improvements, and those authorities admit the charge with regret that it should be true, both parties are in error;—the former in laying on the Government a duty which does not belong to them,—the latter in admitting themselves to be chargeable with a duty which is really beyond their province, and which, on any considerable or sufficient scale, it is impossible they should fulfil, while the charging of themselves with it, although in wrong, prevents anything effectual being done towards it by others. Their answer, if I am right, should have been, “It is not our business,—

make the roads yourselves, and make what profit you can by them;—we will stand by and see all rights defended, yours and others alike;—we will look into the rights, and you, with all others, shall have such laws as are necessary to define and enforce them.”¹

I am not so sanguine as to imagine that these views will be generally admitted, except slowly, as events may show their truth. Nor might it be safe to risk the progress of public

¹ It has been urged that, in India, the Government should undertake the construction of common roads and railways, because it is the owner of the land. Three considerations seem to me to oppose this view of the subject:—1. It is scarcely true that the Government is the owner of the land. No doubt, among the conflicting opinions and pretensions which have arisen out of our imperfect and slowly-acquired knowledge of Hindoo institutions, this claim has appeared, and has been acted on; but, I believe, the best-informed persons now maintain that there is little or nothing in Hindoo usage or common law to sustain more than a right in the Government to the tax on the land, with a power of alienating the tax in favour of individuals. Any appearance of more than this seems to have arisen merely from failure of claimants (which may easily happen in a country where superfluity of land reduces all to small value), and not from a constitutional right in the Government. No doubt, however, in many districts, from the extensive prevalence of such failure, the Government has a power of appropriating land to itself or others, which practically amounts to ownership. In other districts ancient rights to land are still exercised to such an extent as effectually to deny that of the Government. 2. If the Government were the owner, it seems by no means to the public interest that it should remain so; for the admission of this principle brings after it that of others necessarily connected with it, which are incompatible with freedom and progress, and especially so with freedom of trade. (See page 24.) Far better would it be to encourage the rise and spread of private ownership of land, if it do not now exist. But to found great public measures on this presumed right of the Government, is, I apprehend, both to acquiesce in the right, and to place great difficulties in the way of reform. A comprehensive view of public interests appears to me to require that neither this government right to the land, nor its alleged corollary, the duty of making railways, should be admitted. 3. Even if the Government were absolute and acknowledged proprietor of all the land in India, it would scarcely follow that it should make the railways, but rather the reverse. The two matters have in themselves no necessary correlation, but, practically, their being in the same hands could hardly serve public interests. If one of our ducal landlords owned all the land between London and Manchester, would that prove the fitness of leaving it to him to make and work an indispensable railway across it? Still worse must it be in the case of the Government, if it were really the universal owner of the land; so much must its attention be occupied with other matters, and its organization be unfit for the prosecution of this object.

works in India by a sudden change from the principles already adopted. But I trust I may, for a moment, assume the truth of what I have already advanced, for the sake of a further practical argument.

If the extreme tardiness of the Indian Government, in public improvements, is a result, not of the accidents of the time, but of the nature of its duties and of the essential conditions of its situation—if the contentment of the people of India with a foreign rule depends on the obviousness of any advantage they may derive from it—and if we have now come to a time when future advantages, and therefore future contentment in India, are dependent on the prosecution of great public works, it follows that it is an unfitting policy on the part of the Government to keep the control of those works in its own hands, or to burden itself with such obligations as render it virtually the owner of them. The same necessities which have so far been a drag on its efforts must still impede them, but must lead to worse consequences as time goes on, and public contentment in India exacts higher degrees and more advanced kinds of prosperity.

And not only as to contentment;—the Government of India encounters practically a recurring series of difficulties, a cycle which has not yet been interrupted. The taxes, said to be too heavy for the paying power of the country, are yet too light to pay for due and efficient government; they cannot be increased without oppression, they cannot be diminished without still greater loss to the people, and yet, more labour is annually wasted than would pay an ample taxation many times over. Education is not enough diffused to raise the character of the whole people, but more is given than can be employed. Food fails; famine decimates the people, and destroys the revenues, while land is so abundant that the people can migrate within the country, and whole provinces spend their unused energies in the production of deadly exuberance. These and the like are the difficulties of the Government. One remedy applies to all, and would clearly break the yet unbroken round; but facts

have shown that the Government itself cannot, in due measure, make that remedy available. It seems to be in the nature of the case that the Government, in this matter, should comparatively ever fail. I do not say that in the last place, and in failure of attempts to apply better principles, the Government should refuse to do for a time what it can in these indispensable means of advance; but it does appear that its main rule of conduct should be to invite, protect, and facilitate the operations of private enterprise—of private enterprise alike dependent on its own strength, and free to put it forth to its own profit.

If it be said that India is guarded against free, effective, and wide-spread British enterprise by the jealousy of the Government, two answers may be given. First;—I by no means found it so. Neither in England nor in India, neither in the highest quarters, nor the lowest, nor any other, did I meet with anything different from a cordial welcome and kindly aid. I heard, indeed, of jealousy in a few personal quarters, but I never met with it, and I never was hindered by it; but I was very much helped by the opposite spirit, acting in all quarters, on all subjects, and in a most honourable degree. Next;—if that was merely my good fortune, and not the usual course of the Government and its officers, if there be a general conspiracy to keep out independent enterprise, or if there be a knot of influential men so situated as to be able of themselves to effect it, let the fact be tested. So long as such a charge remains merely the complaint of an individual, or the unsustained allegation of an avowed opposition, it will have little weight, and can do little towards remedying the evil. But an actual obstruction placed in the way of earnest, self-relying efforts, would at once supply a fact under the stimulus of which public opinion could not fail to open promptly whatever is now barred. The attempt must succeed either way;—if there be no such obstruction it would succeed because there is none; if there be such an obstruction, the death-blow to a system of exclusion, as directed against really independent undertakings, would be given by the very act by which the exclusion was attempted.

It has often been said that if the Government had not engaged in wars which have been deemed extremely censurable, both as to justice and policy, it would have had funds with which to effect great public improvements. For argument's sake let this be so; and let it be granted that these wars were all as needless and as blameworthy as their most earnest impugnors assert them to be. To what does this state of the case lead us? Passing by the known fact that these wars did not generally originate with the East India Company, but with the Imperial Government or its representatives, we come to this,—that the rulers of India have done just what other Governments have done, viz., they have embarked in needless, costly, and unjustifiable wars. The next question is,—what is the probability of this course being avoided in future? Does the conduct of any other Government afford a hope that by some modification of political arrangements this proneness to war will be counteracted? Take autocratic Russia—antiquated Austria—confederated Germany—newly-constitutionalized Prussia and Sardinia—hereditary, democratic, imperial, restored, Orleanized, and again democratic France—republican America, from Maine to Buenos Ayres—take even constitutional England—and which of them has shown that, *in the mere nature of its government*, it possesses any security against the recurrence of ill-judged, if not unjust, wars? Look more widely still on history, and is there one single form of government, from the despotism of Persia, Turkey, and Spain, to the republicanism of Greece, Switzerland, and Italy, under which wars of the most questionable character have not been absolutely popular?

If, then, all that which is yet known of the science or practice of government supplies no probability that in future wars, however unwise, will be avoided, how can we persuade ourselves to risk the construction of public works, of vital necessity to India, and of high importance to England, upon the chance of our being able to devise for India some new plan of policy which shall accomplish this hitherto unaccomplished end?

And if this be manifestly imprudent on general considerations, still more so is it in view of the special circumstances of India: for here we have no sufficient basis of enlightened and well-informed public opinion, either in the ruled or the ruling country; and the task is, in fact, that of constructing some scheme of mere bureaucracy, which shall restrain this deplorable but universal tendency of men.

But instead of complaining, however justly, of the wars of the Government, and waiting until the Government, contrary to the tenour of the world's experience, becomes of itself a final and sufficient barrier against war, should we not do better to act on another view of the case? The influences which go effectually to prevent war act primarily on the people; and they act on Governments, for the most part, only through the people; and might we not more reasonably hope to prevent wars in India, by giving to the people healthy elevating occupation, and sound instruction, through the operation of roads, than to obtain roads through success without precedent in preventing future wars?

There are interests in England deeply concerned in the questions which have now been discussed. If the views I have exhibited be correct, the course to be taken by those interests is to help themselves, and not to rely on the Government, except for that essential matter, the careful and vigorous fulfilment, in relation to railways and other roads, of its own proper function, that of a judge and protector of rights. To suppose that in the present condition of India the economics of that country can be reached through its politics is, I conceive, a great mistake, into which we may easily be led by the false analogy of English examples; and I must venture to express a belief that every attempt of this kind, except as a minor and auxiliary measure, will fail, and that it would fail if the Indian Government were remodelled from one end of its constitution and proceedings to the other.

The shareholders of the Indian railway companies have a guarantee of a minimum interest of five per cent.; and as far

as their own advantage is concerned, the attainment and possession of this guarantee are fair and legitimate objects. But the question may come to be whether the existence of a proprietary which is denuded of nearly all motive to the exercise of the duties and vigilance of proprietorship, is compatible with the attainment of the great public objects which only these undertakings can accomplish; and it may possibly be found that nothing can compensate for the absence from its place in the requisite system of motives of those considerations which should incite a public body to vigilance through a sense of its own interest. Protection here, as all over the world, may be found incompatible with advance; and yet on that advance may other vast results depend.

If, then, we have a Government which is necessarily, and by no avoidable fault, the slowest in the world in matters of industrial enterprise, and if associated with this we have a proprietary body which is deprived of every inducement to activity, we can hardly wonder at the excessive length of time occupied by every movement connected with Indian railways. The perfection of complication, and of all the machinery of delay, seems to be attained in the working constitution which, in these bodies, has resulted from the combination of a many-limbed Government with a railway company, each seated by parts on two continents. The Board of Control, the East India Company, the Government of India at Calcutta, the Government of Bombay, the Railway Board in London, the Railway Board in Bombay, the Government engineer, and the railway company's engineers in London and in India—all these must be satisfied, or at least may require to be satisfied, not only as to laws and general principles, but as to every bargain to be made, and every practical step to be taken. To the notorious working disadvantages of every Government are here superadded the equally notorious disadvantages of a public company; and the whole combination is deprived of the only interest by which it might have been stimulated—that of the proprietary body.

The character of the course adopted operated from the beginning—the natural were overlaid by the artificial considerations. Time has already rendered the effects sufficiently visible. I believe that no fact affecting the case of the Great Indian Peninsula Railway Company is better known or established now than it was four years ago; but it was not sooner than last month (November, 1850) that the works were begun, and then only under a provisional arrangement, and in a very limited form. Nor did a question exist four years ago, nor has one since arisen, transcending in importance or difficulty scores of questions which have arisen, been settled, acted on, and almost forgotten, during that period in all other departments of public and private business. To confine our view to public events, political and industrial.—Switzerland has been revolutionized, and its revolution has been healed. France has rejected a dynasty, fought through dangers which threatened her very foundation, voted and acted on a constitution, and seems settling again to peace. Germany, Italy, and Sardinia have been upturned from end to end. Hungary has risen and been crushed. The Austrian Empire has been remodelled. Our own chartism has had a full cycle of energy and decline. America has conquered and released Mexico, and founded three or four new states. California has been peopled, and has been entirely lifted from a desert to an acknowledged place in the community of nations. Central America, hitherto too rude and lawless for enterprise, has been pacified, and has authorized great highways of nations across her territories, which are already in progress, and which, guaranteed in safety and neutrality by England and America, will soon be animated by the commerce of both hemispheres. Large amended schemes of colonization from our own country have been proposed and carried into effect. The entire agriculture, commerce, and navigation of Great Britain have been removed from their old legal foundations, and placed on an improved basis, radically and essentially new. Colonial constitutions have been discussed and settled between the antipodes. Natal has sprung

into existence. Borneo has been planted as a centre of civilization. The Punjaub, twice conquered in this interval, has been annexed. The railway system of England has had an entire circuit of revival, excitement, and collapse. The lines of steamers across the Atlantic have been tripled. The electric telegraph, little more than a hopeful revelation of science at the beginning of the period, has become all over Europe and America a necessity by land, and is now traversing the sea.

While the world has been thus astir in all other quarters, and is now replete with enterprises, many of which, when the Great Indian Peninsula Railway was proposed, had not even been imagined, that undertaking, with every essential fact ascertained, and with interests of the highest importance depending on its action, made till almost to-day no progress but in talk and papers. It is perfectly reasonable to anticipate that if the principles which have led to this result continue to predominate, the Americans will have a railway from Cape Canso to St. Francisco, from the Atlantic to the Pacific, across all the difficulties of the entire breadth of their continent at its widest, before a line from Bombay touches the crest of the ghauts.

The argument thus pursued goes, if well founded, to show that, in the case of Indian railways, such a guarantee as places the Government, in any degree, in the position of a proprietor, works to all interests great disadvantages, and to some even danger; and that private enterprise, under due regulation *as to rights*, is the only legitimate, and may prove the only practicable, mode of securing the prompt and effectual construction of a sufficient system of those great and most important works. If it were requisite to take any guarantee of the Government (which is doubtful), this view of the subject would show it to be only one of indemnification, in case of such failure, on the part of the Government itself, to fulfil its own duties, as that damage should arise from public violence.

But it is impossible not to doubt whether, inadequately informed on Indian subjects as the public of England still re-

mains, this view of the matter will ever be acted on, in the case of the early Indian lines. While, therefore, this discussion may show that extended enterprises of this nature in India are little likely to be founded on the principles hitherto adopted, and while we may well regret the delays and loss which have necessarily followed from the system of guarantee, it is not to be denied that the greater evil of doing nothing compelled submission to the use of this embarrassing device. As, therefore, the subject stands at present, we have only practically to consider, in respect of immediate measures, what it is which existing circumstances permit, and what it is which great interests now require; not, however, that all hope is to be abandoned, that a spirit of inquiry may arise which, with no long delay, shall lead to the prevalence of stronger convictions, and of corresponding energy of action.

Limiting, then, the remaining discussion to the narrowest view which present necessities allow, I will advert only to two points of such a nature as to conduct those who take an interest in the subject to a due consideration of the rest. These are:—first, the extent to which the line and the guarantee ought at once to be carried; and, secondly, the disposal of the profits.

I have already stated that the surveys and estimates of the Great Indian Peninsula Railway Company were extended to nearly 200 miles from Bombay; a corresponding capital would be something more than two millions sterling, and on such a capital was a guarantee solicited. The long hesitation of the Government, and the imminent risk of the entire extinction of the design, led to the proposal to carry the line in the first instance only to Callian, with a guaranteed capital of 500,000*l*. On this shortened line, which presents the prospect of just a safe investment, and but little more, it was believed that establishments would be organized and preparations made for the larger undertaking; and that by this means not much time would really be lost. Unhappily, as much delay has taken place in making any beginning whatever as would have sufficed

to complete the short line, and set on foot the long one. The events of the times now show that the pressure of public interests imperatively requires the immediate extension of the railway to the length already surveyed, and (if unfortunately necessary to that end) the immediate extension of the guarantee to a corresponding amount. The considerations which seem to me to dictate this step are the following :—

1. The supply of cotton to England from America has fearfully fallen off, and may still further decline. An effectual remedy for the consequences of this declension lies—if all I have said be not erroneous—in the constructing of this line. But the line will be nearly useless, as to this particular effect, until it has passed some fifty miles beyond the ghauts.

2. The line, while extended to Callian only, is not likely to afford such profits as will supply the needful stimulus to the extension of the system. If the execution of that line had been promptly effected, the time it would have occupied might possibly have been spared for the experiment, and the great essential undertaking, although delayed to great disadvantage, might at no distant date have been opened throughout. But that period of tolerable delay has been lost, and the entire system of railways in Western India will hardly wait longer for experiments. For it must be remembered, that it is not merely shareholders' dividends that wait for these railways, nor even cotton, though that would be much, but, in a sense far too important to be slighted, our general system of commerce, and of manufacturing prosperity. The stimulus of large profit from the first line, which is the indispensable moving power of the whole future system, and of its effects on English commerce, cannot be felt until the railway has attained the extent I have already described.

3. To the next consideration I have already briefly adverted. It is founded on one of those local circumstances which, in some form or other, are found to be attached to every individual enterprise, modifying essentially its practical character, and on a right knowledge and management of which the success of

the whole scheme of action often depends. By the way of the Malsej, in fact on the ascent of the ghaut itself, there are tunnels, the execution of which will occupy from three to five years. There is no probability that any other line up the ghauts could be constructed in less time. The Thul Ghaut road, of five miles long, with no tunnel whatever, has been finished only within these few months, after several years of continuous and well-directed labour, and the employment, I believe, of all the hands which could be made available. If, early in 1847, the Government and the railway proprietary had been prepared to take a large and just view of the question, the first stroke at the works on the ghauts would have been struck before the end of that year; and in 1852 or 1853, the whole line would have been opened from Bombay to the Gunguthurree, if not quite through to Candeish. Thousands upon thousands of bales of cotton, more than ever yet came, might reasonably have been expected at Bombay and Manchester, from the effectual removal of the difficulty which now *alone* limits the cultivation, and defeats the attempted commerce. The time past is irrecoverably lost, and we still have to reckon, as we should only have had to reckon then, from the date of the commencement of the works on the ghauts. To this loss of time, so much to be regretted, surely not that of another year will be added¹.

For these reasons, then, wholly beyond the advantage of the shareholders though they are, but acting, in some respects, through that advantage, and strictly concurrent with it, the line from Bombay should be at once extended into the interior, to points beyond the ghaut country. It is much to be regretted, that this extension should depend on any question of guarantee; but if, on the one hand, the whole business has been brought into such a

¹ The consequences of another local fact should also be considered. Part of the line in the Concan and on the ghauts lies in jungle: this will require to be cleared: newly-cleared woodlands are found to be more unhealthy for the first two or three years after clearing than they were before, although subsequently they acquire the ordinary salubrity of open lands. If the line be cleared only just as it is wanted, a frightful sacrifice of life will probably be the consequence, which might be avoided by the foresight of an earlier clearance.

position that only a guarantee will secure the immediate undertaking of the extended line, I feel satisfied, on the other, that a due examination of the subject, in all its bearings, would at once lead the Government to the requisite extension of present engagements. If the other presidencies should require corresponding advantages, the obligations of the Government under this head would apply to about 7,000,000*l.* sterling, for which sum an effectual start would be given to the system in each of the three great divisions of India.

The disposal of the profits is a question with which, it seems to me, a government, on principle, should not meddle. It happened, however, that the negotiations between the Government and the Indian Railway Companies took place, in part, during the time when English railways were thought good enough to yield more than 10 per cent. per annum, and when the Government took power to reduce their profits to that rate, with consequent stipulations as to purchasing the lines. Little has been heard of the subject of late; not, I apprehend, so much from an admission of the doctrine that government ought not to interfere, as because railways are not now thought so well worth having. The Indian authorities, besides making the line only leasehold for 99 years, took like powers for reducing the profits; and if an Indian railway were to earn very large dividends (the best thing by far which could happen to India), no doubt the Government would think to step in, and would probably be backed by public opinion (although, I think, mistakenly) in doing so.

Good policy, as well as principle, seems to me to forbid this interference; for the welfare of India would be vastly more promoted by that vigorous and early extension of the system, which large profits alone can ensure, than by any saving to the people which could arise from curtailing the profits.

If, however, it be in vain, as I fear it is, to stand up for the principle, it is at least possible to inquire how the interference of the government can be best exerted. That it should not be so exerted as to prevent the realisation of profit, and some

degree of participation in it up to any attainable point, follows from this consideration,—that an interference which absolutely limited the dividend to a certain amount, would effectually check all economy by which it might have been augmented. When the dividend had reached the permitted gauge point, nobody would care for further improvements or economy; directors, officers, servants, from highest to lowest, would at once begin to regard further efforts as useless and uncalled for; and all that might have been further effected would be lost alike to the railway company, the government, and the public. The plan I propose is free from this objection; it permits any amount of profit to be realised, while it directs the disposal of part of a supposed surplus in such a manner as to unite the interests of all, and leaves the other part to the enjoyment of the shareholders.

I have already shown, to the satisfaction, I hope, of those who are accustomed to inquiries of this nature, that the following figures are near the truth:—

	Pence per ton per mile.
1. The present charge for carriage in the countries between Bombay and the interior is about	4
2. The charge which may safely be made to the public for carriage, by railway, is	2½
3. The cost to the railway company, all charges included, but not dividends or profits, would not be more than	1

The cost of constructing and furnishing the line would not exceed, per mile, 15,000*l.*; and the quantity of goods to be carried would not be less than 180,000 tons per annum, and would probably become double that amount. The length of the line may be taken at 200 miles.

From these figures it follows, that the direct money saving to the public of Western India, in the cost of carriage, from the establishment of this railway alone, would be the difference between 4*d.* and 2½*d.* per ton per mile, on 180,000 tons of goods per annum, carried over 200 miles, which, by compu-

tation, amounts to 187,500*l.* per annum. This is the present amount of annual absolute waste in carriage on that route.

I do not stay to remark on the loss of the sum of 750,000*l.*, which four years' delay has inflicted on Western India, further than to note, that it far exceeds the probable cost of the line as far as Callian; or, to put it in another form, the annual waste by the present modes of carriage on this route only, would pay the wages and superintendence of 20,000 men, whose strength is now thrown away in the mere extravagance of rudeness, whilst it might be employed to ample profit. Like many other instances of delay with respect to Indian roads, it shows that no precipitancy, if not mingled with dishonesty, could have been so great an error, or have occasioned so great waste, as procrastination.

The difference between 2½*d.* and 1*d.* per ton per mile, which would otherwise be profit, is that to which the discussion as to the disposal of profits applies. I suppose I may safely assume that, under the operation of the railway, the traffic of the country would increase one-half, or, from 180,000 tons per annum, its present amount, to 270,000 tons; if so, the profit of 1½*d.* per ton per mile, on 200 miles, would amount to 393,750*l.*, which, if the line cost the extreme sum of 15,000*l.* per mile, is rather more than 13 per cent. per annum, independent of profit from passengers.

In considering how this sum may be best disposed of, it may first be stated that, as the country to be traversed by these lines has no roads or rivers, there are no existing lines to act as feeders to the railway; a circumstance in which the case differs from that of every line in England, where a railway must cut many old routes of every kind, all ready prepared to bring traffic to the new trunk. To construct branch common roads would, therefore, be a work in which the interests of the railway company concur with those of Government and the people. I propose, as follows, that this object be effected by means of part of that amount of profit which would otherwise be deemed liable to reduction.

Let 8 per cent. on the capital, if that amount or more be earned, be set apart as an untouched dividend for the shareholders, amounting to	£240,000
Let 2½ per cent., or half the difference between 8 and 13 per cent., be added to that dividend	75,000
	<hr/> £315,000

Let the remaining 2½ per cent be devoted to the construction of cross roads connected with the railway, which, at 1000*l.* per mile (an allowance for roads metalled and bridged throughout, for which there is ample authority), would give more than 70 miles of new road per annum, or in ten years a greater length of made roads than now exists in all Western India, and of a greatly superior kind.

On this plan the advantage to the public would be, first, a direct saving of 187,500*l.* per annum in the cost of carriage, and next, the increase of the common roads of the country in length by more than 70 miles, or in value by the sum of 75,000*l.* per annum:—the profit to the shareholder would be the entire dividend earned, if it did not exceed 8 per cent.; but on the supposition that the profits earned were more than that amount, he would receive half of the excess. Thus, if 13 per cent. were realized, he would receive 10½; if 15 per cent., then 11½: always 8 per cent., and half the rest. The remaining half of the profits above 8 per cent. would accrue to the public in the form of roads equally beneficial to all parties. It is scarcely necessary to say, that 8 per cent. is here a figure used merely for illustration, and that the principle is compatible with the adoption of any other which would leave a surplus.

If any interference of Government with profits be permitted, it appears to result from obvious considerations, that a plan which, like this, maintains the interest of the railway company in good management, while it so applies any surplus profits, as to promote objects confessedly beneficial alike to all parties, must best avert the practical evils which would otherwise result from interrupting the ordinary and legitimate course of industrial enterprise.

I am aware that the suppositions and figures I have em-

ployed in these computations of the effect of the suggested arrangement, are smaller than those I have previously used for the same purpose. It is with design that I have kept them far below the limits which a moderate view of the facts would give them. The case needs no straining; and I have found that large anticipations, however well supported by evidence, repel confidence, and turn aside inquirers from investigation. To speak of a profit above 5 per cent. is as useless in some quarters, as to promise a barometric pressure of 50 inches of mercury, or a lunation of 40 days. It is not considered that, in such a case as the present, natural laws do not interfere to keep down profits to a customary standard; and that a railway which supersedes most costly and disadvantageous carriage has the vast difference between its own effects and the old state of things as the fund from which to draw its own reward.

If there be those who receive with incredulity the facts I have alleged, I appeal, for their satisfaction, to the authorities on which I have relied. My footsteps may be traced from fact to fact through the whole series: not a statement of importance have I made on my own authority, nor one connected with the amount of the existing traffic which requires other confidence than that given to the public and official documents of the Government itself; and I cannot but hope that the powerful interests which are so deeply concerned in a right understanding of Indian subjects, and whose prosperity becomes every year more closely involved in that of our Indian empire, will give to my allegations and arguments the most trying scrutiny. If only this scrutiny be entered on, and thoroughly effected, I am bold to express my earnest conviction that Indian railways in general, and the line whose facts I have been discussing in particular, will appear invested with an importance, and will receive a practical support, far surpassing any yet conceded to them.

If it should seem that in a book professing to discuss questions connected with the great interests of India, too much attention has been given to the mere locating, construction, and profits of a railway, let me suggest that the practical possibi-

lity of inventions and undertakings from which have flowed the most important and wide-spread consequences, has often depended on wearisome experiment and repulsive calculations. It is in vain that we attempt to render our progress wholly ethereal; we cannot make it exclusively dependent on idea, or the realization by incorporal means of idea, whether by government, by association, by teaching, or otherwise. Our daily steps are ever found allying themselves with that which is material and of practice. Whatever power some amongst us may have to penetrate the darkness before and about us, we make little advance in the common use of their discoveries, but as we advance also in the knowledge and application of physical facts. If we had full and perfect theories of sociology and government, and if we knew exactly all that goes to make up the perplexing aggregate of Indian economics, I apprehend we should be in condition to effect but little by means of our knowledge, unless better means of communication than now exist enabled us to apply it. To say, then, that the social and political elevation of India, on any considerable scale, must commence with the construction of its roads, is, I conceive, only to state for this particular case what the experience of the world has established in all others; and it is also, I hope, to assign a sufficient reason for any solicitude I may have shown as to mere physical facts.

Further—if these undertakings have a commercial value at all like that which my arguments would assign to them, they require a vigour of prosecution which can be derived only from an intimate conviction of their safety and value as investments; and that in its turn depends on a knowledge of the facts. I trust, then, I have not magnified beyond their value the real circumstances of the case, by employing them in the hope of converting a mere acquiescence derived from a guarantee, into an energetic belief founded on the merits. If England and India need these railways, they need just as much the establishment of the motives through which they may be effectively prosecuted.

There is, indeed, hardly a consideration connected with India and with our concern in that country which does not ultimately conduct us to the question of the internal means of transit. Many of these have been adverted to in the preceding pages; to many others the limits of this book do not permit just and sufficient attention. A very brief review of the different aspects under which these undertakings present themselves, recording a few of the interests they affect, may afford an appropriate close to these disquisitions.

To the capitalists of England it must be an object of prime importance to open a new field for the profitable use of their ever-increasing accumulations. Year after year adds to the difficulty of keeping up the rate of interest; for year after year witnesses greater additions to our power of supply than to the accessible markets to be supplied. India, shut up merely by want of means of transit, presents at once a vast scene of occupation for capital in constructing railways, and one still greater in the augmented commerce which must be consequent on the use of them.

Our merchants, manufacturers, and engineers—all those whose assiduity, skill, and science bring together the accumulations of the capitalist and the present labour of the workman—have, like our workmen and artisans themselves, the strongest interest in obtaining 100,000,000 of additional customers, now debarred by poverty from taking part in the reciprocations of commerce, but whose demands might equal the whole of those we at present receive from other quarters, and who would be found capable of repaying us amply for large supplies of manufactured goods. In vain is it objected that the Hindoo is irredeemably poor, and of a nature altogether unchangeable. It is impossible to travel for a week in his country, or to examine any of his institutions or usages, without seeing marks of frequent, long-continued, and recent change: his very turban, now worn in every form and even by the lowest, is said to be an innovation adopted from his Mahomedan conquerors. This people show, at every turn, a disposition for the enjoyment and display of wealth; their land

teems on its surface with untouched sources of profitable matters of exchange, beside whatever may lie below. We need only the means of access to render the soil of India a full storehouse of plenty, and the people our willing friends and customers.

The native of India who, under enlightened teaching, longs for the elevation of his countrymen, will see in the establishment of easy, safe, and frequent transit, the removal of the difficulties which most impede the efforts made to instruct and improve them. Whether he looks to the direct diffusion of knowledge, to the more effectual exercise of the protecting function of the Government, or to the still more intimate influence of full employment for the capabilities of his countrymen in invigorating and profitable pursuits, he cannot but hail in these undertakings the means and precursors of the highest good he can anticipate or desire.

The Government of India, devoid of that which is the strength of every pure and honest government—a well-informed and energetic public opinion, has the deepest concern in whatever leads to the intelligent use of the resources of the country, to the establishment of great native interests of kinds sensitive to the dangers of interrupting the public tranquillity, and to the formation of a public opinion which shall be the due defence and support of all. An industrial body, deeply pledged, by their interests and habits, to the peace of the community; and a thinking people, judging vigorously and rightly of the facts and causes of their condition, and affording the strong and willing support of free opinion to a government intent on their advance, are the natural consequences of extended intercourse, the indispensable prerequisite of which is improved means of communication. With such support, drawn from instructed native intelligence, the supremacy of Britain must become in time a blessing from which the future generations of India will date the regeneration of their land.

To the philanthropists of Britain never has a field been opened like that presented to them at the present day by India. Torn through unnumbered generations by tyrannies, exactions,

CONCLUSION.

and wars, the country, with its 100,000,000, now breathes comparatively in quiet. The arena for moral and intellectual triumphs has been cleared by agencies which, however Providence may employ them, or however justifiably they may have been brought into action, a Christian philanthropist would scarcely dare to use. But, however cleared, India now requires and invites a work greater than that of Penn or Clarkson—greater than that which Britain has already accomplished in India, in substituting order and quiet in some good degree for turmoil, violence, and danger, and making common-wealth instead of king-wealth the object of sovereign rule; for the new work will look forward to the establishment of peace, as in England, on principle and enlightened choice in the people, where it is now the peace of the Government and of its lawful sword. Nor can we forbear to lift our eyes to the period, however distant, when the intelligence derived from free and cordial intercourse, and from ample and healthy occupation of the cultivated energies of the natives of India, in the enlarged prosecution of just and honourable interests, and in the seeking of more refined and more extended gratifications, shall have been found incompatible with the debasing grossness of superstition; when the fervent aspirations of the Hindoo mind shall have learned to long for a higher morality and a happier faith; and when the way shall have been prepared for the truth and purity which the Almighty and Universal Father has given to form the highest happiness of the whole family of man.

APPENDIX.

APPENDIX A.

STATEMENT OF THE PRICES AND QUANTITIES OF EAST INDIA
AND OTHER SPECIFIED COTTON IMPORTED INTO GREAT
BRITAIN, FOR THE YEARS MENTIONED.

Date.	Price of other than East India Cotton at Liverpool.	Price of Surat Cot- ton at Liverpool.	Total Import into Great Britain from India.	Aggregate Import- ation into Great Britain.	Date.	Export to Great Britain from Bombay.	Export price at Bombay.	Export to Great Britain from Calcutta.	Export to Great Britain from Madras.
	Pence per lb.	Pence per lb.	lbs.	lbs.		lbs.	Pence per lb.	lbs.	lbs.
1781	1.	2.	3.	4.		5.	6.	7.	8.
1782	W. India	....	.. ..	5190-778					
1783	20 to 42	....	.. ..	11-820-030					
1784	13 - 36	....	.. ..	9-735-663					
1785	12 - 25	....	114-133	11-402-063					
1786	14 - 28	....	11-440	18-400-384					
1787	22 - 42	....	99-455	19-475-020					
1788	10 - 34	....	.. ..	23-250-268					
1789	14 - 33	....	.. ..	20-467-436					
1790	12 - 22	....	.. ..	32-676-023					
1791	12 - 21	8 to 10	4-973	31-447-605					
1792	13 - 30	8 - 15	492-207	28-706-075					
1793	20 - 30	11 - 16	3-351	34-507-497					
1794	13 - 22	10 - 16	.. ..	19-040-929					
1795	12 - 18	9 - 11½	729-634	24-358-567					
1796	15 - 27	11 - 22	239-245	20-401-340					
1797	12 - 29	11 - 22	197-412	32-126-357	1795-6	.. ..	..	608-256	
1798	2 - 37	10 - 23	609-850	23-354-371	1796-7	.. ..	..	296-400	
1799	2 - 45	20 - 26	912-844	31-880-641	1797-8	.. ..	..	517-632	
1800	16 - 36	10 - 18	1-762-784	43-370-270	1798-9	.. ..	..	3-007-296	
1801	17 - 38	14 - 18	6-712-622	50-010-732	1799-1800	.. ..	..	315-264	
1802	12 - 38	10 - 18	6-629-622	56-004-305	1800-1801	.. ..	..	140-000	
1803	8 - 15	9 - 14	4-088-256	60-345-600	1801-2	Val. to sup.	670-500	68-000	
1804	10 - 18	8 - 15	2-679-483	53-612-204	1802-3	.. ..	155-435	621-600	
1805	14 - 19	12 - 17	3-182-360	61-967-329	1803-4	.. ..	277-065	726-000	
1806	15 - 21½	.. ..	1-160-355	59-682-406	1804-5	.. ..	173-154	180-000	
1807	15 - 19	.. ..	684-050	58-170-233	1805-6	.. ..	*568-725	726-000	
1808	15 - 36	14 - 25½	2-725-450	74-925-000	1806-7	Rep. lost.	.. ..	2-194-500	
1809	14 - 34	11 - 26	3-983-150	43-605-962	1807-8	.. ..	782-635	1-115-100	
1810	14 - 22½	12 - 19	4-729-200	92-812-282	1808-9	.. ..	683-182	604-800	
1811	12 - 16	10 - 13	12-517-400	132-489-935	1809-10	1-210-844	.. ..	12-234-300	
1812	13 - 25½	12 - 16	27-793-700	91-578-535	1810-11	1-055-935	.. ..	1-043-100	
1813	21 - 30	15 - 20	5-126-100	915-050	1811-12	.. ..	30-000	48-000	
			487-350	50-963-000	1812-13	.. ..	..	....

Date.	Price of other than East India Cotton at Liverpool.	Price of Surat Cotton at Liverpool.	Total Import into Great Britain from India.	Aggregate Importation into Great Britain.	Date.	Export to Great Britain from Bombay.	Export price at Bombay.	Export to Great Britain from Calcutta.	Export to Great Britain from Madras.
	Pence per lb.	Pence per lb.	lbs.	lbs.		lbs.	Pence per lb.	lbs.	lbs.
	1.	2.	3.	4.		5.	6.	7.	8.
1814	23-37	18-25	4 725 000	60 060 239	1813-14	Probable lbs. 68 494	Prob. 6 16	3 511 500	
1815	18-25 1/2	14 1/2-21	8 505 000	99 306 343	1814-15	359 165	6 16	6 476 100	
1816	15-21	14-18 1/2	10 850 000	93 920 055	1815-16	711 736	6 16	5 168 400	
1817	16 1/2-23 1/2	14 1/2-20	40 294 250	124 912 968	1816-17	4 341 944	6 16	23 262 258	
1818	16 1/2-22	7-20 1/2	60 555 000	177 282 158	1817-18	13 829 139	6 16	38 890 075	
1819	10-19 1/2	5 1/2-14 1/2	62 405 000	149 739 820	1818-19	25 300 712	6 01	35 721 988	
1820	8-13 1/2	6 1/2-12	20 294 400	151 672 655	1819-20	13 450 739	5 87	9 204 900	
1821	7-11 1/2	6 1/2-9 1/2	10 626 000	132 536 620	1820-21	2 347 190	5 72	3 801 700	
1822	5 1/2-11	5 1/2-8 1/2	6 742 050	142 637 628	1821-22	3 509 563	5 57	1 617 368	
1823	6 1/2-10 1/2	5 1/2-8 1/2	13 487 250	191 402 503	1822-23	10 214 010	5 43	1 951 272	
1824	7-10 1/2	5 1/2-8	17 796 100	149 380 122	1823-24	8 956 639	5 28	3 475 078	
1825	6-19 1/2	4 1/2-16	21 175 720	228 005 291	1824-25	15 595 278	5 13	3 647 688	482 551
1826	5 1/2-8 1/2	4 1/2-7	22 644 300	177 607 401	1825-26	20 595 066	4 99	4 805 200	639 478
1827	4 1/2-7 1/2	3 1/2-6 1/2	25 742 150	272 448 909	1826-27	12 284 429	4 34	4 149 036	312 818
1828	5-7 1/2	3 1/2-5 1/2	29 670 200	227 700 642	1827-28	20 112 691	4 69	1 396 756	204 200
1829	4 1/2-7	2 1/2-5 1/2	28 147 700	222 767 411	1828-29	23 517 070	4 55	1 191 952	300 995
1830	5 1/2-7 1/2	3-6	12 324 200	263 961 452	1829-30	7 759 801	4 40	611 804	244 551
1831	4 1/2-7 1/2	3 1/2-6 1/2	26 828 900	288 674 853	1830-31	17 643 172	4 40	2 117 158	964 902
1832	5-8 1/2	3 1/2-5 1/2	38 249 750	286 632 525	1831-32	16 966 022	4 37	1 267 556	3 684 241
1833	6 1/2-12 1/2	4 1/2-8 1/2	33 139 050	295 908 765	1832-33	33 955 302	4 34	897 080	1 567 634
1834	8 1/2-10 1/2	4 1/2-7 1/2	32 666 560	326 719 586	1833-34	28 794 623	4 31	1 078 464	462 000
1835	9 1/2-12 1/2	6 1/2-8 1/2	45 076 820	368 690 544	1834-35	32 177 712	4 58	3 046 546	2 560 500
1836	7 1/2-11 1/2	5 1/2-8 1/2	79 449 730	403 914 078	1835-36	45 795 596	5 09	1 063 926	6 838 500
1837	7-8 1/2	4 1/2-6	52 090 137	402 187 973	1836-37	68 163 901	3 52	1 583 094	6 518 000
1838	6 1/2-9	5 1/2-6 1/2	38 232 612	497 641 405	1837-38	39 100 472	3 30	379 496	642 000
1839	5 1/2-7 1/2	4 1/2-6 1/2	46 932 633	387 902 349	1838-39	31 800 807	3 24	292 904	1 894 000
1840	5 1/2-7	4-5	78 692 592	572 644 461	1839-40	59 001 134	3 58	2 097 150	9 379 500
1841	4 1/2-6 1/2	3-5	100 104 510	474 063 453	1840-41	81 581 688	3 50	106 272	2 925 000
1842	4-6	3 1/2-4 1/2	67 889 923	492 091 907	1841-42	104 795 091	3 10	365 064	8 771 000
1843	4 1/2-6	3 1/2-4 1/2	60 063 096	621 346 697	1842-43	69 839 914	2 95	169 490	2 652 500
1844	3 1/2-4 1/2	2 1/2-4 1/2	85 612 461	591 753 837	1843-44	91 781 820	2 92	142 926	2 330 500
1845	3 1/2-4 1/2	2 1/2-3 1/2	55 196 328	659 684 477	1844-45	62 296 954	2 62	109 470	7 609 500
1846	6-7 1/2	4 1/2-6	33 711 420	442 759 336	1845-46	47 105 311	2 44	....	3 257 000
					1846-47	.. ..	2 33	....	....

AUTHORITIES.

Col. 1. From Burn's Statistics of the Cotton Trade, page 14.

2. From ditto;—from 1790 to 1796, are the prices of Bengal and Surat Cotton at Manchester, from page 20;—after 1796, they are the prices at Liverpool of Surat and Madras, from pages 21, 22.

3 and 4. To 1833, from pages xiv. of "Reports and Documents" of 1836; after 1833 from Burn, page 17.

5. To 1833-34 inclusive, from Parl. Pap., No. 194 of 1847, page 10, col. 2; thenceforward from the Report of the Cotton Committee of Bombay, page 24,

Note.—Values only are given in the Parliamentary Return; but from 1814 forward, the quantities are deduced from the values by means of the probable prices in the next column; and the results agree sufficiently with other facts.

- Cgl.⁶ 6. To 1834, by means of inferences from a few known facts, chiefly the price stated by Col. Williams in Baroche, in 1817-18, the price given by the Government of Bombay to Bulwunt Singh, of Ahmednuggur, in 1830, and a statement made, in 1833, by Sir John Malcolm, in his book on the Government of India, page 111; after 1834, from the Report of the Cotton Committee of Bombay, page 25.
7. From Parl. Pap., No. 353, of 1847, page 2.
8. From Parl. Pap., No. 333, of 1847, page 4, to 1832-33; thenceforward from Bombay Cotton Report, page 27.

DATES OF PRINCIPAL EVENTS CONNECTED WITH THE SUPPLY OF COTTON FROM INDIA
TO ENGLAND.

1757. Battle of Plassy.
1769. Arkwright's first patent.
1774. Legal restrictions on the manufacture of cotton fabrics in England removed.
1780. Muslins began to be manufactured in England.
1781. Cotton rose in Bengal from 3*d.* per lb. about this time to 6*d.* per lb. in 1789, apparently from the English demand for cotton cloths.
1783. First importation of cotton into England from Brazil.
1787. The manufacturers of Lancashire petitioned (happily without success) against the importation of Indian muslins and calicoes.
1788. The East India Company, on the representations of the English manufacturers, began to urge the exportation of cotton from India to England.
1789. In this year the price of cotton on the spot at Baroche was 2*14d.* per lb.; in 1809 about 3*52d.*; and, in 1817-18, about 4*89d.* It was exported to Bengal in the early part of the period, and to England also in the latter. As is well known it has since greatly fallen.
1793. First considerable importation of cotton from the United States. Invention of Whitney's sawgin.
1794. The East India Company first sent out to India a machine for improved cleaning of cotton; the same has been done at several subsequent dates.
1800. The use in India of superior seed apparently first suggested; carried into effect on many occasions afterwards.
1800. Prices in the Madras Presidency from 2*14d.* to 3*14d.* per lb.; advanced in 1814 in some districts to nearly 6*d.*, and, in 1812 to 1813, in Coimbatore, to 8*d.*, apparently from the effect of the American war.
1807. December. The American embargo.
1809. February. The American Non-Intercourse Act. The East India Company urged dispatch of cotton from India.
1810. Very large stocks on hand in England sold at great loss.
1812. American War.
1813. Trading monopoly of the East India Company partially abolished. Mr. Metcalfe, from America, sent to India with machines for improved cleaning of cotton.

1814. Peace with America.
1815. General peace in Europe. Freights during the latter years of the war were from 15*l.* to 22*l.* per ton, equal to 2·62*d.* and 3·84*d.* per lb. of cotton.
1816. Attempts by the Government of Bombay to introduce Bourbon seed, and to improve the cultivation of cotton; continued in all the presidencies for many years.
1817. Fall of the Peishwa; suppression of the Pindarries; general pacification of India.
- 1817-18-19. Speculative exportations of cotton from India to England; exportations from Calcutta to America, for mixing with the cotton of that country previous to shipment for Europe.
1820. Great fall of price in England; price in Calcutta still kept up to 1*s.* per lb.; distress and disturbances in the manufacturing districts of England.
1826. Commencement of the traffic in cotton between Berar and Bombay. Great fall for several previous years in the export of manufactured cotton goods from Bengal to Europe.
1834. The East India Company restricted from trade while holding the powers of a government.
1836. The East India Company published a collection of papers on the cultivation of cotton, silk, and indigo in India.
- 1836 and 1837. Interference of the United States' Bank in the operations of the cotton trade.
1837. Abolition of the inland transit duties in the Presidency of Bombay, and soon afterwards all over British India.
1839. Seizure of opium in China, followed by war, and consequent diversion to the English market of the customary supply of cotton for that country.
1841. American cotton planters employed by the Government for the improvement of the cultivation, arrived in India.
1842. Peace with China.
1846. A committee appointed by the Government of Bombay, on representation of the merchants of that place, to "inquire into the extent and causes of the decline represented to have taken place in the cotton trade, and to suggest any remedial measures which in their opinion may with advantage be applied to it." Date of Report, 23rd March, 1847. Parl. Pap., No. 712, of 1847.
1847. The East India Company made a return to Parliament of their official correspondence and proceedings on the growth of cotton in India. Parl. Pap., No. 439, of 1847.
1848. A select committee of the House of Commons, appointed on the motion of J. Bright, Esq., "to inquire into the growth of cotton in India." Report, dated 17th July, 1848. Parl. Pap., No. 511, of 1848.
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APPENDIX B.

REPORT OF R. STEPHENSON, ESQ., M.P., C.E., TO THE DIRECTORS OF
THE GREAT INDIAN PENINSULA RAILWAY COMPANY.

GENTLEMEN,

Having had for some time the various documents relative to your proposed undertaking under consideration, I now beg to lay before you such remarks as the perusal and study of them have suggested.

When I commenced the examination of the various voluminous plans and documents, I did so with considerable diffidence, because I felt that any opinions which I might express, based on documentary evidence alone, would be likely to mislead rather than to guide, in the consideration of an undertaking of such extent, and situated in a country to which I was a stranger. My difficulty in this respect, however, was almost entirely removed by the personal communications of Mr. Chapman; his intimate knowledge of the country through which the projected line is to pass, and his clear and detailed verbal descriptions of the physical features of the surface (which he has given me at great length), accompanied by sections furnished by your engineers, Messrs. Clark and Conybeare, from actual levels, have made me feel so conversant with the chief objects and characters of the undertaking, that I venture to express the opinions I have arrived at, with nearly as much confidence as if I had myself visited the country.

In an undertaking of this description, the two main points to be considered are—the commercial wants of the district, and the engineering facilities for supplying them.

In reference to the first, they are succinctly described in a letter addressed by Mr. Crawford to the Bombay Government, 6th June, 1846. From this document it appears that the great commercial object to be attained is the opening an easy communication between the rich producing districts of the interior, called the Deccan, extending in a line nearly due north and south from Candeish to Sholapoor, with the Presidency and Port of Bombay.

A very cursory examination of the map of this part of the Indian Peninsula is sufficient to show to the engineer that the principal difficulty to be overcome consists in surmounting the Syhadree range of mountains, which stretches uninterruptedly between these two districts. A further study of the map renders it evident, also, that

the insular position of Bombay imposes another, and very important, condition on the direction of the line, irrespective of the range of mountains just named, viz., that it must proceed from Bombay through Salsette to Tannah, this being the only point where it is feasible to form a connection by railway between the island and the main land. Tannah may be, therefore, regarded as the starting point; consequently every approach towards the various passes over the ghauts must, in a great degree, be governed by it.

For, passing the Syhadree range, your engineers have selected the Malsej Ghaut; and, as the passage of this point is the only one which presents any formidable engineering difficulty throughout the line, it has had my special attention.

Looking carefully at the map of this part of the range, I was struck with the circumstance that, in the vicinity of the Malsej Ghaut, several streams seemed to radiate from it in different directions as from a focus, which led me to suspect that the lowest ghaut had not been selected for passing this range of mountains. I called Mr. Chapman's attention particularly to this point, as one of the utmost importance, since any material improvement in it might possibly bring the gradients of this part of the line within the range of locomotive instead of stationary power, as at present proposed. Mr. Chapman had, fortunately, the information at hand, both as regards the principal levels (which are partly given in Lieut.-Col. Sykes' interesting memoir of the geology of a part of the Deccan and Syhadree range, and partly from his manuscript report of the same district in the possession of the East India Company), and also the characters of the districts and the difficulties which would present themselves in other parts of the line, supposing any other ghaut were adopted¹. The letter which Mr. Chapman addressed to me on this subject is so carefully and clearly drawn up, that I cannot for a moment withhold the expression of my conviction that the Malsej Ghaut has been judiciously and properly selected. The other parts of the line proposed by your engineers do not call for any remark from me: their reports give all the necessary details, which appear to have been very carefully studied, and, as far as I am able to judge, have been discreetly carried out.

¹ These facts were obtained chiefly from the letters of Dr. Gibson, Superintendent of the Government Botanical Gardens, and Conservator of the Forests, in Western India; of Major Liddell, Commandant of the Police Corps of the Poonah Collectorate; and of Mr. Langford, Collector of Ahmednuggur.

As designed, therefore, your undertaking may be described as a line running north and south from the Pera river, through Alleh to Mhuse near Seroor, a distance of about seventy miles, with a transverse line from Alleh to Tannah and Bombay, a distance of about 100 miles, without presenting any serious engineering difficulty, excepting at the Malsej Ghaut, which is confined to a distance of about eight or nine miles, where the gradients are such as to require either stationary engines, or locomotive engines, with ropes so adapted as to work in conjunction. This latter method I think would be preferable; it is less costly, is better adapted for a fluctuating traffic, and is more economical for the amount of intercourse which is calculated upon in your statements of traffic¹.

With such an arrangement there can be no difficulty in working the traffic with regularity, dispatch, and economy. The length of this difficult ascent is, no doubt, unusually great, and the proposed gradients very severe; but, excepting in the length, it does not differ from examples which exist in several mountainous countries where railways are in daily operation. Looking, therefore, at the facilities which are reported by Mr. Clark and Mr. Conybeare to exist throughout the remainder of the line, I cannot but regard the whole as easy of execution. The construction of a series of tunnels in the ascent to the Malsej Ghaut is the only work which would require an unusual time for completion, since the great height of the ground over the line of tunnels would render shafts inordinately expensive, if not absolutely impracticable. Several years would certainly be required for the completion of these works; but this fact need not, I think interfere with the immediate prosecution of that portion of the line over the Concan, extending from Bombay to the western foot of the ghauts, a distance of 80 miles.

The next point to which I may direct your attention is that of cost; and here I fear that my views and those of your engineers will not coincide.

Their estimate for a double line does not exceed 12,000*l.* per mile, and in arriving at this they have evidently taken much pains to collect the prices for which work is now done in the districts traversed by the proposed railway. I do not doubt the accuracy of these data, nor that of the calculations of the amount of work to be performed, as described by the sections; but experience in this

¹ It will be remembered that this was written before Mr. Clark had found, in the second season, an eligible line of ascent practicable by locomotives.

country, as well as in tropical climates, in executing work of a novel character, leads me to distrust any conclusions arrived at by such methods. I am, of course, unable to state the precise extent to which my notion of cost would exceed that calculated upon by your engineers, but I would certainly not venture upon recommending you to reckon upon less than 25 per cent. above their estimate, or say about 15,000*l.* per mile.

In considering the cost of your undertaking, I would also suggest that you limit your expenditure in the outset to a single line of rails between Alleh to the Pera River, and from Alleh to Mhuse. Throughout this distance there appears no immediate necessity for the formation of double lines; the traffic will evidently be divided at the bifurcation near Alleh, probably into nearly equal parts, and the distance in either direction from that point within the command of two engines which might be worked with perfect safety for the amount of traffic as shown by the table. In examining the estimates of the amount of traffic submitted to me by Mr. Chapman, I have, of course, had the advantage of his verbal explanations; indeed, without this privilege I could not have offered an opinion on the subject, which under every circumstance is so difficult to treat with accuracy; but in this department of railway calculations it fortunately happens that the amount of traffic is rarely if ever overstated, when ordinary care is taken to avoid hypothetical items. In the present instance, Mr. Chapman appears to me to have been exceedingly scrupulous: he has chiefly drawn his data from official documents, which I take it for granted are indisputable, and he has moreover, avoided reckoning upon large increase in the existing intercourse: I am inclined, therefore, to believe that the tonnage is rather under, than over, stated.

In the statement of net proceeds, the expenses are taken at about 600*l.* per mile, which I should think ample, since the price of labour is exceedingly low, the advantage of which will be felt after the line is opened, and the natives accustomed to the duties of working and maintaining railways.

This is an advantage that would not be felt in the first construction of the works, which will explain my reason for recommending an addition to the estimate, whilst I do not suggest it in reference to the working expenses.

In conclusion, Gentlemen, I hope these few observations will sufficiently explain to you the views which I have taken of your pro-

ject, and I trust that they will enable you to decide upon the proper course to be adopted in carrying out a work, the importance of which has grown upon me exceedingly since I commenced the examination of the documents laid before me. Whether such a gigantic work—in a distant country, where the resources, both for executing and working it, are necessarily limited, as compared with European nations, where railways have been so successfully established—should be left entirely to private enterprise, is a question I must leave for those to decide who are intimately acquainted with India and its people.

In an experiment of this kind, so fraught with benefit to the country, whatever may be the results to the original promoters, I cannot help thinking that aid from the Indian Government is not only desirable, but necessary.

However this may be decided, I am certain, from the information which has already been collected, that there is no country where the advantages flowing from the introduction of railways will be more signal than in India; and I believe that no country will participate more promptly in the beneficial consequences than Britain.

I am, Gentlemen,

Your most obedient servant,

(Signed)

ROBERT STEPHENSON.

APPENDIX C.

NOTICE OF THE PAPERS SUBMITTED TO MR. STEPHENSON, AND OF THOSE CONTAINED IN MR. CHAPMAN'S REPORT.

IT will be seen from the foregoing report, that the engineering papers submitted to Mr. Stephenson were sufficiently full and conclusive, to enable him to form definite and satisfactory opinions on all points of this nature which at present require to be considered.

The following account of the statistical papers alluded to by him, together with his report, may supply a general view of the financial prospects of the undertaking. These papers are (were then) being reprinted *verbatim* from the Bombay edition, with additional maps and notes, and will soon be ready for such of the shareholders as may choose to investigate the subject more minutely.

The papers are as follows:

I. A letter from R. W. Crawford, Esq. (of the firm of Messrs. Re-

mington and Co.), the Chairman of the Company in Bombay, to the Hon. Sir G. Arthur, Governor and President in Council in Bombay, dated June 8, 1846, describing the lines generally, stating the reasons for adopting the particular route laid down, and submitting the line for the examination of the Government.

II. A letter from R. W. Crawford, Esq., the Chairman in Bombay, to the Hon. L. R. Reid, Esq., Governor and President in Council in Bombay, dated 13th October, 1846, laying before the Government the statistical documents framed by Mr. Chapman (which are hereinafter enumerated and described), together with the reports, plans, and sections of Messrs. Clark and Conybeare, the Company's engineers in India. In this letter Mr. Crawford, writing in the name of the Bombay Board, fully adopts the conclusions then arrived at by the officers of the Company, as given below.

III. A letter from Mr. Chapman to Mr. Crawford, dated 1st September, 1846, containing an abstract of the statistical papers then submitted to him by the Bombay Board, and deducing from them the final result as to dividend.

IV. An abstract, by Mr. Clark, of his report on the line from Bombay to the summit of the Malsej Ghaut, and thence, by inference as to cost, to Alleh, 109 miles from Bombay.

V. A memorandum by Mr. Conybeare of the line from the top of the Malsej Ghaut to Alleh, and thence to the Pera river, with notices of the lines he explored from the Pera river to Indore, Hoshungabad, and the coal-field of Baitool.

VI. A general statement of the expected traffic, in which official authority is given for seven-eighths of the amount, and very probable amounts for the remaining eighth: from this paper it appears that the traffic now existing and likely to come to the railway, is 180,000 tons per annum.

VII. A paper devoted to the traffic in salt, in which it is shown that this article will be carried from the coast into the interior to the amount of 80,000 tons per annum; which traffic is included in the previous statement of 180,000 tons per annum. A memorandum by Mr. Ayrton of Bombay, attached to Mr. Crawford's letter of 18th October, 1846, shows that the manufacture of salt in the neighbourhood of Bombay can be greatly extended, to the certain advantage of the Government, and the very probable advantage of the railway.

• VIII. An enumeration of many instances of the actual cost of carriage by the existing native means; from which it appears that in the districts traversed by the proposed lines, a rate of $2\frac{3}{4}d.$ may be charged by the railway, without exposing its traffic to risk from competition. To this paper are appended very important statements by R. Fenwick, Esq., of Khamgaum, in Berar, respecting the cost and difficulty of conveying cotton by the existing native methods.

From these statements a conclusion was drawn, that if, on the one hand, the cost of construction and working did not exceed the estimates, and on the other, the goods' traffic did not increase, and *no passengers were carried*, the dividend would be 11 PER CENT. PER ANNUM. The account stood as follows:—

Annual cost of working the line from Bombay to Alleh with 180,000 tons of goods per annum	£74,021	Revenue from 180,000 tons of goods carried between Bombay and Alleh, 109 miles, at $2\frac{3}{4}d.$ per ton per mile	£224,812
Annual cost of working the line from Alleh to the Pera river, and from Alleh to Mhuse	22,357	Revenue from 90,000 tons of goods carried between Alleh and the Pera river, the latter being the assumed limit of the Gunguthurree, 81 miles, at $2\frac{3}{4}d.$ per ton per mile	31,969
Balance applicable to dividend, being 11l. 0s. 11d. per cent. on 1,863,053l., the cost of construction	205,778	Revenue from 90,000 tons of goods carried between Alleh and Mhuse, (12 miles south-east of Seroor) 36 miles, at $2\frac{3}{4}d.$ per ton per mile	37,125
		Additional revenue for 120,000 tons of goods carried up the Malsej Ghaut, double mileage, being $2\frac{3}{4}d.$ per ton per mile for 6 miles	8250
	£302,156		£302,156

Mr. Conybeare's estimates were not in hand when the preceding calculation was made, but have since been received and submitted, with the other papers, to Mr. Stephenson; they render necessary a slight correction of the foregoing estimate of results; and besides

this, Mr. Stephenson recommends, in his Report, that 25 per cent. should be added to the estimates of construction, on account of the rise of prices which the construction of the railway may produce. On the other hand, experience has shown, in every case, that the opening of a railway always increases the traffic, and most so where the traffic had previously been small. To double the previous traffic, is the lowest of usual results, and it seems may be reasonably expected in the present case. The account corrected according to these views, is as follows :—

The cost of construction, as estimated by the engineers, is . . .	£1,927,319
Add, according to Mr. Stephenson's suggestion, 25 per cent. . .	481,830
	<hr/>
	£2,402,149

Subtract for making single lines, instead of double, from Alleh to the Pera river, and to Mhuse, as advised by Mr. Stephenson, one-third of 758,662 <i>l.</i> , which sum would be the cost, if double	252,874
	<hr/>
	£2,156,275

Or say, 2,200,000*l.*, the cost of 176 miles of railway.

ANNUAL DISBURSEMENTS.	ANNUAL RECEIPTS.
Cost of working the line from Bombay to Alleh, taken at double the sum stated in the foregoing account . . .	Revenue from carrying 360,090 tons of goods per annum, being double the sum of the items in the foregoing statement . . .
Ditto for working the lines from Alleh to Pera river, and from Alleh to Mhuse, doubled as before . . .	<hr/>
Balance applicable to dividend on 2,200,000 <i>l.</i> , or 18½ per cent. . . .	£604,312
	<hr/>
	£604,312

In this account, *no credit is taken for profits from passenger traffic*. Nothing certain or even probable is known of their amount; but as it is likely they will not be inconsiderable, they may for the present be set against unforeseen expenses, errors which have been overlooked, or any reduction in the rates for carrying goods which may be deemed advisable.

Feb. 1847.

APPENDIX D.

LETTER OF J. CHAPMAN TO R. STEPHENSON, ESQ., M.P., ON THE
REASONS FOR PREFERRING THE ROUTE BY THE MALSEJ GHAUT.

3, New Broad Street, January, 1847.

SIR.—The question which I understood you to raise in one of our late conversations is this:—"Seeing that two large river systems, those of the Godavery and the Khristna have their most remote sources near the Malsej Ghaut, and that even another, though a smaller one, has its origin at the same place, there is reason to suppose that that is a comparatively high point; why then, in an engineering view, is it selected for the place at which to cross the Great Syhadree range?" I understood also, that from the structure of the country, as exhibited by the map, you supposed that if any better line could be found, it would be to the northward of that now selected, and submitted to you. I might perhaps sufficiently answer your own inquiry, if I were to confine this notice of the subject to the peculiarities of the country north of the Malsej Ghaut; but since public convenience, as well as the real facts of the case, are more likely to draw attention to a line south of ours, I have judged it proper to include in it such facts and considerations as may show why this line has been preferred to all others, both north and south of it.

The commercial reasons for preferring this line, are given in Mr. Crawford's letter to the Bombay Government of 6th June, 1846, paragraphs 4, 5, 6, 7, 8 and 9, of which I have sent you a copy¹. Possibly I may again refer to some commercial reasons for this preference, but at present I assume that those given in the letter above quoted, are forcible enough to show that any other line must be not only as good, but very much better than that by the Malsej Ghaut, if, on the whole, it is to be preferred.

Correctly speaking, we can hardly consider Bombay as the point which, in these inquiries, we are to take as the origin of the railway. That important seat of government and of commerce, is situated on the shore of an island; and its harbour, which is eight miles wide, intervenes between it and the main land. This water narrows in going northwards, until at Tannah, 23 miles distant from Bombay, it is capable of being conveniently bridged. A railway brought to any other point than this, would require that

* Inserted at the end of this Letter.

the communication with Bombay should be completed by embanking the goods and passengers on the waters of the harbour; and, in addition to the usual inconveniences of such a course, will here be found the heavy swell not unfrequently setting into the harbour during the monsoon. I believe all parties at Bombay have long since given up the idea of any such broken line; nor are we likely to doubt the propriety of their doing so, when we take into account the results of European experience, and remember that this line is to answer the purpose of a great trunk communication. In all following statements, therefore, I shall take Tannah, and not Bombay, as the point to be reached by all possible lines from the interior.

Although your inquiry pointed rather to the north than to the south of the present line, as the district in which to look for a preferable one, I take up the comparison with the southern district first; for it is much the better known in respect of the details of its physical characteristics, and it will probably supply some particulars which, by analogy, may help us in considering the other.

For the immediate purpose it will probably be a sufficient description of the line by the Malsej, to say, that, except the incline at the ghaut, it consists of first-class gradients, obtained with little cutting or embankments, for all the distance along which the southern traffic would pass; that the ghaut rises to a height of 2100 feet; and that this is the highest point to which the line, *as so far considered*, rises; and that the actual ascent, other than by ordinary locomotive engines, is a little more than 1700 feet, and is nearly a straight line. No account is here made of the hope that a better ascent can be found close by¹.

The main line of traffic to the south-east of Bombay, now crosses the Syhadree range at the Bhore Ghaut: in the progress of railway enterprise in India, public attention will probably be directed to this line; and it, or one near it, to be hereafter mentioned, may best be compared with that by the Malsej. Here the ghaut rises, at its crest, somewhat less above the level of the sea, than at the Malsej; but the actual ascent, as far as it is affected by steep inclines, will be nearly as great; because the foot, as well as the head, of the ghaut is lower. Campolee at the foot, is not 200 feet above the sea; while the Government Bungalow at Khundalla—the lowest point the railway would probably reach on the table

¹ This was written before Mr. Clark, in the second season, found another line up the Malsej Ghaut, which is capable of being worked by locomotives.

land—is 1800, leaving at least 1600 feet to be accomplished by stationary engines. The ultimate height to which the traffic would be lifted, is as great as at the Malsej; for beyond this is a severe locomotive ascent, through heavy cuttings, to the elevation eventually of something more than 2000 feet. The ultimate elevation to be reached is, therefore, little below that of the Malsej, nor is the ascent by stationary power much less.

The character of the ascent is not likely to be found so favourable as that of the Malsej. The present road, which was obtained by means of considerable works, is about three miles long, and has in that distance about forty well-defined turns, besides less conspicuous curvatures; and it leads to a point 150 or 200 feet higher than that I have supposed the railway to arrive at. The steep flanks of the several mountain masses, as well as the chasms whose bottoms are the beds of torrents descending from the table land, afford the means of obtaining a workable incline for stationary engines, or a set of such inclines; but the benching and other works would be very heavy, and the incline would probably be not less severe than one in five; certainly not less so, if my recollection be right, than one in ten.

The current mileage of this line, is, on the whole, not likely to be so favourable as that of the line now laid out. On this subject, Dr. Gibson, under date of 8th October, 1848, writes me as follows:—"In communicating with Tannah, (that is, in the Concan,) the road must either be led through a long tract of treacherous and generally overflowed soil near the sea, or must be led so as to cross the long run of hilly ground formed by the spurs of Pabul (or Prubhul) and the Match Ran."

So also above the ghaut occurs the additional ascent I have already spoken of. Dr. Gibson says, "The country for four miles would be found very expensive to work. This can easily be verified by a reference to the cost of the present made road, east of Khundalla; one portion is usually called the 20,000 rupee mile." (The usual cost of making new roads of this kind is 5000 or 6000 rupees per mile.) This account agrees exactly with my own recollections, and as very considerable undulations are here combined with a general rise of 200 feet in five miles, it is hardly likely that heavy works and severe gradients would be avoided. When on the ground, it appeared to me improbable that a better line than that of the present road could be found.

'Beyond this rough margin to the ghauts the country is level, while it remains in the valley of the Inderownee. The fear is, that, without considerable embankments, it may be overflowed by the river. I observe, that for a considerable distance near Wurgoom, the Government road is raised above the fields four feet or more. I do not think the passage into the valley of the Powna would be found very difficult; but for a short distance, I imagine a severe gradient or two would be encountered. To Poonah, and thence eastward, I think no further difficulties would occur.

If this line be considered even with reference to the southern traffic only, it has not a great advantage in point of length over that by the Malsej. The two lines may be considered as starting from Tannah, and uniting again at a point in the valley of the Beema, a little below the mouth of the Moota Moola; they run along the opposite pairs of sides of a trapezium, and the difference in length is not more than 10 or 15 miles, or from a twelfth to an eighth of the whole distance¹; neither do the elevations of the summit levels differ greatly. Goods from beyond the junction might therefore travel almost as well by one line as the other, supposing both made. But if the Malsej line were first made for other reasons, it would cost immensely less to make a line to communicate with Bombay through it, than to make a new line by Poonah and the Bhore Ghaut.

It is almost impossible to suppose that the northern traffic would be brought to the line by the Bhore Ghaut. A railway for that purpose would involve bridges over the Beema, the Yeil, the Goor, and the Kookree, where their beds have become wide and deep, and their waters, in the rains, full and rapid; and the route would involve an additional distance of probably 60 miles for a very large amount of traffic.

Without the northern traffic, this line, not so cheaply made as the Malsej line, and very little shorter, would have less than half the employment.

Poonah, it is true, is a large city and cantonment; but its chief articles of subsistence do not pass along this line; they are drawn from the southward, south-eastward, and northward.

The passengers between Poonah and Bombay, who pay for riding in a public carriage, do not amount to 1000 per annum.

¹ Since a line from the Bhore Ghaut must probably follow the Oolassa River to a point several miles to the eastward of Callian, even this small advantage in length would not in fact attach to it.—J. C., Dec., 1850.

There can be no doubt that, sooner or later, this line will be required for the convenience of Poonah; and when the railway system has become sufficiently familiar to native artizans, there will probably be little to deter enterprising persons from undertaking it. But it was set aside, *for the first line to be undertaken*, from its being not better in an engineering view than that by the Malsej Ghaut, without having its commercial advantages.

It is probably not necessary to advert to possible lines south of the Bhore Ghaut. The difficulties in the Concan increase, while those above the ghauts do not diminish. Besides, if the line of the Bhore Ghaut is already too far south for the northern traffic, it is useless to think of going further south except on the understanding that the northern traffic is given up. I proceed, therefore, to describe briefly the valleys and ghauts between the Bhore Ghaut and the Malsej Ghaut, beginning at the southern end of the series.

The Koosoor Ghaut leads into the valley of the Under. Its line would be merely a modification of that by the Bhore Ghaut. Probably it would encounter rather worse ground in the Concan, and rather better above the ghaut. Of the ghaut itself I know nothing which is quite conclusive; but I have reason to surmise that both the existing road, and the flanks of the ranges, are steeper than those at the Bhore Ghaut. This line would be as unsuitable to the northern traffic as that already described.

The next valley, that of the Baum, is said by Captain Liddell to be "very narrow," and by Colonel Sykes "to commence about seven miles from the crest of the ghauts, where the mountain masses separate into two spurs;" statements which I conceive agree in shewing that, for a considerable distance from the western precipices of the ghauts, the ground is very elevated and very difficult. Colonel Sykes also remarks that the Baum, like the Under, runs 150 feet below the cultivated lands; from which it is probable that the level of these valleys is higher than that of their fellow tributary of the Beema—the Indrownee, which has no such peculiarity; and to the same conclusions the barometrical levels of Colonel Sykes would lead us. The two ghauts which lead into this valley seem not to indicate that any advantageous place for our inclines can be found here. One of them is a footpath, up which a great deal of timber is carried from the forests below.

We come now to the valley of the Beema; of this Dr. Gibson says, "The next is the Ghaut of Beema Shimkur, access to which,

from below, is somewhat circuitous, and a little difficult; but the height of the ghaut itself (3000 feet), and the extremely difficult descent before we can reach the plain at Deembah, render this line a part of the question." Colonel Sykes says, "The river rises on the elevated table land, about the ghauts, at 3090 feet, and within the first few miles tumbles over several terraces. The valley, for eighteen miles, is, occasionally as narrow as that of the Moota river." Of the valley of the last-mentioned river, he had just before said, "It is so exceedingly narrow that, for some miles, the bases of the opposite hills frequently touch each other, leaving at intervals little horizontal plots, of a pistol shot in width." Captain Liddell says of this valley, that "in descending from the source of the Beema, you enter the Ran-Mulla, a dense jungle, which extends 600 or 700 feet above the level of the Beema, which runs along the north side. Numerous small villages are situated along the banks, with warrees (small outlying hamlets) among the hills. The Umba and another small stream intersect the valley."

Proceeding northward, we come to the valley of the Gor; according to Captain Liddell, "one of the wildest and least accessible of any along the range; it is intersected, in all directions, by the tributary streams which unite and form the Gor, a little above Ambegaom, near the village of Wojpeh. The villages are small, and generally situated on table lands, on sides of the hills, with numerous warrees wherever there is a spot fit for cultivation." Colonel Sykes says, "This valley, from the sources of the river to Munchur (29 miles), is exceedingly narrow and tortuous." Dr. Gibson states that "he has no knowledge of the nature of the country immediately below, or of the ghauts, which lead from the Concan into the head of this valley; but above, the ghaut debouches into a narrow and steep valley, which bounds the upper part of the course of the Gor river. This valley is in many places so narrow, and the hills are so steep, that works could not be formed save on a level with the river; and thus they would be liable to all the accidents caused by a treacherous alluvial soil, and to frequent floods in the rainy season."

The two ghauts which lead from the Concan into this valley seem to be steep, and the table land at their summit nearly as high as that of Beema Sunkur; or about 2800 feet above the sea.

We now come to the valley of the Meena. This is not mentioned by Colonel Sykes. Dr. Gibson says that "its ghaut, the

Dareh, is a small steep ghaut, overhung by the rocky promontory of Dah, a dangerous proximity, as the sudden fall of rocks from above, not unfrequently causes accidents to passengers here; the country above is difficult and winding, till it reaches the Meer valley." Captain Liddell's statement is, that "the Ambolee Pass leads into the Concan from the top of this valley; there is considerable ascent from this (the eastward) side, and it is but little frequented."

The next valley in the series, that of the Kookree, I have seen. The ghaut at the head of it, is the Nana Ghaut. Of this, Dr. Gibbon says, "It is steep, and probably could not be made practicable for carriages. One mile north of it is a ghaut presenting not many difficulties, but the country E.S.E., through which the road must lead, is very impracticable, consisting of a series of very long rises and falls, following the meanderings of the Kookree river." As I had seen this valley, Captain Liddell does not describe it. My notes, made the next day, contain the following account of it: "From Heerde (five miles from the ghaut) to the end of our long evening's walk (westward) the country is, for railway purposes, of the most discouraging description. We could see to the ghaut itself, and there seemed no improvement in the valley. It need not be denied that a railway might, at a very great expense, be constructed in it; but as to taking this valley with that of the Malsej so near, I think it must always be out of the question. There is a *considerable* ascent before the ghaut descends, the range over which the road passes being distinctly visible to us, and seeming to connect the elevated masses on each side." (This ridge, or probably the road over it, is stated by Colonel Sykes to rise to the height of 2435 feet above the sea.) "It seemed probable, that if a practicable line could be found at all, it would be along the base of a range on the north side, gaining the level of the Kookree by gradually descending the slopes of the ravine along which the river passes."

The ride next morning brought us as far down the valley as Kamgaom. In this part of the valley the spurs were as numerous and as elevated as in that we saw the evening before. Opposite the village of Oosera there is a ridge quite across the valley, formed, as it were, by a spur from each side, meeting in the middle, instead of interlocking, as in other places. Through this ridge the Kookree passes by a deep cut.

As far as Kamgaom, and probably further, this description of the valley still applies. Approaching Jooneer, it appears (from an elevation at a distance) to be a plain intersected by many deep ravines.

Finally, we arrive at the Malsej Ghaut, and its valley the Mhurra Khora, along which flows the Khristnawuttee. Of this, the section already given from survey, will sufficiently speak; but it may not be without use to contrast the language of two of the preceding authorities in respect of it, with that they have used in the foregoing description of the other valleys. Colonel Sykes says, "It is several miles wide, and literally as level, even to the brink of the ghauts, as if smoothed by art;" an expression, whose strength no doubt is derived from the impression he had retained of the rugged features of the other valleys. In another place he quotes this valley, as one of a few which, from the neighbouring heights, appear "as flat and smooth as a billiard-table; but when traversed are found to be cut up by numerous narrow and deep ravines." How little such ravines interfere with the general character of the valley, or the excellence of the line, the section already made will show. Dr. Gibson says, "Above the ghaut the ground presents an absence of dips, and a level difficult to be found elsewhere. In fact, as the first report truly states, the only work of any size is that of crossing the river Khristnanuddy, near Ootoor. No amount of prejudice or misrepresentation can succeed in distorting the very patent features of this the Mur valley. The country from Mur to Alleh is throughout open and healthy." Captain Liddell, knowing that I was intimately acquainted with this valley, did not notice it in his letter; but in my notes of conversations with him at Poonah, before I visited it, I find it stated as follows: "The valley into which the Malsej Ghaut leads, is perfectly level and very rich. From the head of the ghaut to Sholapoor, not a single difficulty occurs. All the other valleys are less favourable, and some of them are much perplexed with the feet of the tranverse spurs interlocking across them."

To these notices of local peculiarities it may be proper to add a few remarks on the general form of the district. The Syhadree range forms almost everywhere, not only the great step from the table land to the lower level of the Coucan; but a mountain margin to the table land itself; its peaks often rising to the height of 2000 feet above the elevated valleys on the east. From this mountain

margin spring the ranges which divide the valleys, and which, by their scarped and precipitous character, prevent all intercourse between valley and valley, except by a few difficult paths. These ranges rise from 500 to 1000 feet, and sometimes more, above the included valleys. Proceeding eastward, the valleys widen and become level, finally merging into the flat country through which the Beema and its northerly tributaries take their course. It is at the head of each of these valleys, and between the mountain blocks from which the several spurs take their rise, that the mountain margin becomes depressed and broken enough to admit of its being traversed by the bullock tracks, or footpaths, called ghauts; but this margin is nowhere broken through except at the Malsej, and, may be, at the Koosoor and Bhore Ghauts; everywhere besides, it has to be ascended from the Deccan, or eastwards, before it permits descent to the Concan or westward country. Midway between the Malsej and the Bhore Ghauts, the range, even at the points where it is passable, seems to rise considerably, and to decline each way: the highest point is that of Bheema Shunkur. The heights are as follows, all being taken barometrically, and quoted from Colonel Sykes's table, except the first, which is from my own observations:

	Fet.
Malsej	2059
Nana Ghaut	2453
Bhore Ghaut	2888
Bheema Shunkur	2982
Neelsee (the ghaut being probably something higher)	2326
Kundalla (average of observations about)	1800

It is from the points of the greatest elevation that the perplexed and broken ground springs, by which the head of most of these valleys is, so far to the east, and so greatly, encumbered.

From all this it follows, that that source of the tributaries of the Khristna which is at the Malsej Ghaut, if the most remote from the main stream, is not necessarily the highest, and indeed is known not to be the highest.

It would be easy to point out other features of the district worthy of remark, and not without bearing on the present purpose; but, supposing that I have said enough to show that there is no ghaut or valley south of the Malsej, which is on the whole preferable to it, I proceed to consider those to the northward.

Here, as before, I take first the road which is at once the line of

the present traffic, and the boundary beyond which we should not think of adopting another line, viz., the Thul Ghaut and its road. I limit myself thus, not from want of facts to show a strong presumption that further northward a better line is not to be found, but that I may speak within reasonable limits, and yet with sufficient particularity, of that which I do describe.

I go first to that part of the line to the Thul Ghaut which lies in the Concan. Mr. Langford, Collector of Ahmednuggur, writes me as follows: "What it is now I cannot positively say; but in my day a worse line of road than this from Shapoor in the Concan, to Kussara, at the foot of the ghaut, engineers could not have hit on. The old gentleman who planned it, had some curious views about road making; and one was, never to go round a ravine when he could go slap through it; and this was the case with the road when first made; but I believe it has since been much improved, and one half the traffic of the Deccan goes by it to Bombay, chiefly carried by cattle. I doubt much, however, if you could have found a line for a rail from Shapoor to Kussara, as, in parts, the country is very rugged, having many deep ravines that would have been great obstacles to the works; added to which this line is, at certain seasons, a particularly unhealthy one—in the rains, a deep jungle; and Kussara, which you must have made a halting station, about as deadly a place as any I am acquainted with, the fevers caught there generally being fatal ones. All these evils you escape by the Malsej route, and have the advantage of a tolerably populous country between Callian and the bottom of the ghaut, and, as far as I recollect, except the one or two rivers you have to pass over, on which you will have few difficulties to encounter. You have also this advantage, that in case of running a branch to the Bhore Ghaut from Moorbar, you will have an easy country to run it over."

Clunes (1826)—"Itinerary of Western India" says,—that "from the ghaut, the same sort of hilly, broken, and rocky roads continues, with little intermission, through thick high jungle, and crossing many watercourses to Kurdee (sixteen miles)." And further on he says, "The whole of the road from Kurdee to Kateewalee (fourteen miles further) may be called a continuation of the pass, the country being hilly in many parts, covered with thick high jungle, and very little cultivation." In the Quartermaster-General's published Routes, 1826, it is stated that "from Kurdee to Kussara" (ten and

three quarters miles) "the march is through a completely ghaut country, and presents perpetual obstacles to troops from the impracticable nature of the nullas' beds; ascents and descents innumerable;" "rocky impracticable soil;" "frequent nullas,"¹ &c.

Although the road has been much improved since their date, it is conceived that the observations just quoted serve to show the generally discouraging nature of the country.

Before I went to India, Mr. Clark, now one of our engineers, was desirous of finding a route from his short line to the Thul Ghaut; this I believe he attempted by avoiding the direct line I have just described, and holding to the north-westward of it. Even this route, he told me, he found as nearly as possible impracticable. In a letter to me, written when he had not carried his exploration, preparatory to survey for us, half way across the Concan, he said that the lower part of the Thul Ghaut line had no advantages whatever over that to the Malsej, and he thought a line might possibly be found to the Thul Ghaut, by Shyera, and up the Basta. Since that time he has become, I believe, fully convinced of the superiority of the line we have taken.

The Thul Ghaut line below the ghaut is not to be preferred on account of population and road-side business. In 1826, Clunes said there was not a single inhabited hut from Egutpoora at the top of the ghaut to Kurdee, sixteen miles from the foot of it. The Quartermaster-General's Routes of the same date, are little less expressive in the same sense. The country to the left or north-west of the line, particularly beyond the Vyturnee River, is a continued forest thinly inhabited by a race of half-savage woodcutters, ruled by native Rajahs, with, I believe, little interference on the part of our Government.

Above the ghaut the present road goes over the usual rugged fringe to the actual ghauts. From Wadewra to Egutpoora at the top of the ghaut (fourteen miles), Clunes says it passes "over an undulating surface, with several steep ascents and descents; but it is perfectly passable for cattle laden." From Nassick, eastward, I believe no difficulty would be found.

Although not much reliance is in general to be placed on the character of the present ghaut roads, as affording indications of the probable existence of good lines of ascent in their vicinity,

¹ For the rise in the Northern Concan, see page 249.

yet, in this instance, we may gain more help than usual from the description given of the existing and intended road; and I am the more inclined to collect here all that I can find on the subject, from having been disappointed of seeing the ghaut myself.

Of the ghauts in general in this part of the Syadree Range, Clunes says that "the country throughout, to the right and left of each road, which (road) itself winds along a ridge (or branch as it may be called) of the highest hills, is completely intersected with similar ridges, extremely steep, mostly too much so, in any cross direction, for even foresters to descend; and the whole face of the country is covered with trees, bamboos, underwood, and long grass. This makes it impracticable for cavalry, except by the roads, or rather paths, all of which might be easily destroyed by cutting ditches across them, where, as is generally the case, they are of earth, or by felling trees across at favourable places. From the tops of the passes the country westward is seen to be covered with jungly hills, for at least fifteen miles in every direction, and water is scarce, generally early in the dry season."

The Government has long been desirous of making this a convenient ghaut, not only to facilitate the passage of troops and mails, but because a very important part of the commerce of Bombay comes from the countries beyond it, and must therefore suffer the loss and inconvenience of this miserable route, or go far round to avoid it. Several officers have been successively employed on it for some years past, and various lines and modifications of lines have been proposed. Lieutenant Chapman of the Bombay Engineers, who is now in charge of the works, writes me, amongst other matters, as follows. After stating that the villages in the neighbourhood are small and few, and that it is difficult to obtain a sufficient number of hands, he proceeds: "During the hot season the scanty supply of water deters workmen from assembling in numbers; during the rains the greater portion are engaged in cultivating their village fields, which occupation an offer of employment remunerating in a quadruple degree, would, I hardly think, induce them to forego. And during the cold season, the climate of the ghaut jungles is of so deadly a nature, especially to a Deccanee man, that few are found willing to stand the brunt of it."

Of the nature of the works he says, "In laying down the new line on the ghaut, a prong from the main ghaut was taken advantage of; up which the road winds with a slope nowhere greater than

one in 20. The total length of the road is 28,452 feet, or five miles three furlongs and 28 yards. The greater portion, by far, is in side-cutting; and that in one instance, for about half a mile in length, in solid black rock, at an angle of 45°. Its width is 22 feet, and where no parapet is required 23 feet is the roadway."

"The inclinations are as follows:—

Feet in length.		Inclination.	Feet ascent
10,167	at	1 in 20	508·35
6,397	„	1 „ 21	304·62
1,746	„	1 „ 24	72·75
2,538	„	1 „ 41	61·90
1,608	„	1 „ 43	37·40
2,685	„	1 „ 44	61·02
3,321	„	1 „ 57	58·26
<hr/> 28,452			<hr/> 1104 30

"From this it would appear that the ascent from Kussara to the top of the ghaut is a little upwards of 1100 feet."

I suspect that from Kussara to the top of the ghaut is in direct distance but about half the length of the road.

This line would be still worse for the southern traffic, than a line by Poonah would be for the northern. It may therefore be concluded that, difficult to make, and troublesome to manage, as it might be, *if the first line made* in this country, it could gain but a part of the traffic which would seek the Malsej line.

An interesting point of inquiry, however, remains, on which I can give only a conjectural statement; it relates to the absolute height of the ghaut above the sea, and the comparison of its elevation with that of the summit level of the line by which it is proposed the northern traffic should reach the Malsej line. The summit level spoken of is near the Alleh Khind, and is 2197 feet above the sea. I nowhere meet with the height of the Thul Ghaut; but I imagine it is something, though not much less, than this. The heads of most of the valleys between the Malsej and Thul Ghauts, are known to be higher than the Malsej; but we may perhaps obtain an approximate conclusion in respect of the Thul Ghaut as follows:—the Pera river, where we cross it, is 1702 feet above the sea; probably the Godavery in the same longitude has nearly the same elevation. That point is, in direct distance, about 42 miles from the sources of some branches of the Godavery, which are near

the head of the Thul Ghaut. If we allow seven feet per mile for the fall (a rate not equal to that of several of the rivers south of the Malsej, and not one-third of that of the Mool, the first to the north of it), we shall find the sources are at an elevation of 294 feet above that point, or of 1996 feet above the sea; and to this probably is to be added the height of the crest commonly found immediately at the summit of the ghaut.

I think, therefore, there can be little doubt that the traffic will have to be carried to a summit level somewhat but not greatly higher, by the route proposed, than by the direct route of the Thul Ghaut; but it is to be taken into account that we then bring it to a line on which it has to bear but half the charge of dividend and management—that we have to make a very much shorter, and probably, mile for mile, a much less costly line—that we avoid the expense and inconvenience of another set of ghaut works—and that we escape to a great extent the dangers and loss which would be certain to arise from our traversing a peculiarly unhealthy district.

For the ghauts and valleys between the Thul and the Malsej, my best and almost only authority is Mr. Langford, the Collector of Ahmednuggur, in whose charge the country is at this time. I quote from his letters, except when it is otherwise stated. He begins at the Malsej.

“The first valley on the Nassick side of Hurrees-chunder,” (*i. e.* the first valley north of the Malsej) is the Kotool, which leads by the large village of Kotool to Sungumnair, a distance of about 30 miles. In this the Mool River has its rise. This would never have done for railway operations, as it is a continuation of ascent and descent the whole distance, with one very bad ghaut, five or six miles from Sungumnair, beyond which the ghaut road is impassable for carts.”

Here I may add, that when Mr. Conybeare and myself were on Hurrees-chunder, from the top of which mountain both this valley and that of the Malsej are overlooked, we did not for a moment hesitate which to prefer, supposing even both were open to the westward, and of equal elevation. But I have not heard of a ghaut leading from the Concan into the head of this valley, and I rather think there is none; or only a difficult footpath. As to elevation it is perceptibly much higher at its head, and for some miles, than the Malsej valley, and falls much more rapidly from end to end: Colonel Sykes gives the source of the Mool River, on the customary

ridge across the head of the valley, an elevation of 2961 feet ; Kotool thirteen miles off is 2163 ; while Gunjpeer twenty miles still further, where we cross the river, is only 1770.

Mr. Langford proceeds:—"The next valley to the north is the Rajoor valley, in which is the source of the Pera River. There is no pass from the ghaut into this, that would at all have answered your purpose ; those leading into it from the Concan being mostly, I may say, footpaths. On the Deccan side of the ghaut, the country, as far as the large town of Ankola (about 23 miles) is wild and undulating, so much so, that no line, even had there been a good ghaut, could have been run through it ; and in addition to this, the road from Ankola to Sungumnair is any thing but a good one, as far as Dandurphul (not quite ten miles) it being very undulating ; but from this to Sungumnair, nine miles, and from Sungumnair to Kolar *it is a dead flat*, and it is over this I believe you contemplate bringing your line.

"North to Rajoor, and between that village and the foot of Patta, lies a tract of country the strongest on the whole range ; it lies very high, and although here and there small valleys run into the plain, the natural obstacles are so many, that making a road over it would, I think, be quite impossible. The only two ghauts leading to this tract are the Choonda and Menda. The road lies from Dholkumb in the Concan, by the foot of Rutnagherrie, now in ruins ; but it is said to be so bad, that even brinjarries scarcely now frequent it, and it would never have answered your purpose. Besides these two ghauts, there are I may say fifty *chorwaras* (*i. e.* bye-roads, or thief tracks), leading from Dholkumb and the neighbouring villages of the Concan, into the Deccan, and which, in the bad days of transit duties, were much frequented by smugglers ; but few of these cattle could go by."

Subsequently Mr. Langford qualified a little this statement about the ghauts in the following words : "Since writing the above, I have heard that the Choonda and Menda Ghauts are not quite so bad as I have represented them ; and that latterly, on account of the scarcity of forage (the last three years were years of drought), grain carriers have frequented them, going to them via Rajoor ; but the country to them is quite what has been described by me."

To proceed:—"North of the hill-fort of Patta, the country becomes more level : the Pimpree Ghaut, leading from Wassalay in the Concan, is said to be easy of ascent ; but I have never passed it ;

it leads on the Deccan side, into a plain over which a good level may have been found by Sinnur to Kopergaum. But my recollections both of the Deccan and Concan sides of this ghaut is, that the access to it is particularly rugged, and that there are certain dips in the Concan side, a look at which would have driven a civil engineer half crazy."

Then comes his description of the Thul Ghaut line which I have already quoted.

He finishes on this subject by saying — "What I have given you here is all from my own observations. I have been over the Kotool valley very lately; the Ankola-Rajoor I have not visited for some years; but a man has a strong recollection of bad roads and other annoyances, and such are mine in reference to the country between the Rajoor valley and the plain country beyond Patta."

In this case, as in the other, I contrast the above language with that employed by the same writer in reference to the Malsej route.

"You have decidedly hit on the very best route into the Deccan—that by the Malsej Ghaut. I have recently been over it, and, excepting the ghaut itself, I can see no impediment to the railway operations; the country on this side, until within three or four miles of Parnair, a place 22 miles from Ahmednuggur, and about 50 from the Malsej, is about as fine a level as could be found in the Deccan, and in taking a line to the north of Parnair, which I believe your engineers are doing, you avoid much of the hilly track, and get into the fine level of the Sungumnair district."

It is true that the opinions of these gentlemen are by no means to be taken as conclusive on engineering points; but considering that their official position at the head of their respective districts and departments, and their long acquaintance with the several localities, have given them strong reasons and ample opportunity for becoming thoroughly acquainted with the great features of the country, I should have thought myself justified in relying on their clear descriptions of other routes, and their strong preference for the Malsej, even if I had not had their opinions confirmed by all that I saw myself. I do not think it possible for a person to see the country between Poonah and the valley of the Malsej Ghaut, without deciding at once, that no line can be taken between them; and, as far as I could judge, by means of distant views from very elevated points, the country to the north of the Malsej is equally decided in character.

Nothing is more likely than that, at some future time, other lines will be made to cross the ghauts and enter the Deccan. I conceive, however, that the points at which this can be done are very few, and are far enough from the Malsej to leave sufficient space for the derivation of a paying amount of traffic from an improved country between them. Nor can this take place, I imagine, for some time to come, if intending new adventurers have any prudent regard for their own interests; but considering that the speculative and adventurous habits of certain wealthy classes of the natives, might easily lead them, under the excitement of novelty, and the example of our success, to schemes injurious to us as well as to themselves, I have thought it necessary to suggest to our board the propriety of obtaining a legislative protection against the risk of premature competition. If that should be obtained, I imagine that the lines as now laid out, would have, in due time, a sufficient remaining traffic of their own, notwithstanding they might be drained of some of their original traffic by more direct lines. In the mean time I concluded (how correctly it is for you to judge) that this line would be made under fewer disadvantages, and with better prospects of success, than any other which the physical features of the country, and the general condition of its population, would permit.

I have only to add, that the books and the originals of the letters I have quoted, as well as any other documents I have in charge, will be much at your service, and that I shall gladly assist in elucidating any other point to which you may direct my attention.

I am, Sir,

Your obedient Servant,

(Signed) J. CHAPMAN,

Manager, Great Indian Peninsula Railway Company.

To R. Stephenson, Esq. C.E.

P.S.—I have omitted to compare the length of the railway with that of the road by which the north-eastern traffic now comes to Bombay, or rather to Tannah. The line it takes from Berar, is through Candish to Chandore, thence by Nassick, the Thul Ghaut, and Bhewndy, to Tannah. Our line is nearly the same with it till we come to Chaleesgaom in Candeish, where we leave it and come to the Unkye Tunkye Pass, and by Kopergaum to Alleh, the Malsej, and so to Tannah.

The two routes are¹ in length as follows:—

PRESENT ROAD.		Miles.
Chaleesgaom to Chandore, by map	49	
Chandore to Nassick, Clunes, 54	40½	
Nassick to Tannah, by a MS. route from the Quartermaster-General's Office, dated 30th March, 1846	93½—183½	

RAILWAY.		
Chaleesgaom to Unkye Tunkye, by map	39	
Unkye Tunkye to the Pera, being six miles less than from Munnar to the Pera; Mr. Conybeare's printed memoranda	51	
Pera to Alleh Khind; railway survey	32½	
Alleh Khind to Koobee; railway survey	21½	
Koobee to Tannah; railway survey	63	
	207	
Difference, the present road being the shortest, or about one-eighth	26	

The geographical distance from Tannah to the Unkye Tunkye pass is about 120 miles, and it is nearly the same to Chandore.

EXTRACT of a LETTER from the CHAIRMAN of the PROVISIONAL COMMITTEE of the GREAT INDIAN PENINSULA RAILWAY COMPANY, to the HONOURABLE the GOVERNOR in COUNCIL at BOMBAY, submitting the intended LINES of RAILWAY for the examination of GOVERNMENT.

To the HON. SIR GEORGE ARTHUR, BART., Governor and President in Council, Bombay.

HONOURABLE SIR,

* * * * *

4. The views which have led to the adoption of these lines may now be stated.

5. Bombay has a peculiar geographical position, which goes far towards determining the direction of the first portion of any railway proceeding from it. For, unless the dictates of experience in every other quarter be disregarded, it will be found necessary to provide that no break shall exist in the line between Bombay and the interior; and a break can only be avoided by crossing to the main land at a point near to Tannah. In all matters, therefore, of a general

nature, affecting the railway system of Western India, the question of reaching Bombay is, in fact, that of reaching Tannah.

6. In determining the course of the line on the continent, certain principles require to be kept in view. Railways are new in India; and the data on which their prospects can be calculated are, to a considerable extent, uncertain; but their introduction and extension are much to be desired, for reasons of public advantage as well as of private profit. If, however, the first considerable attempt should fail to be a profitable one, great discouragement to future enterprise will necessarily ensue; on the contrary, a successful railway will be the precursor of many more. The only method of gaining all the security for a desirable issue of the first attempt, is so to lay out the first lines, that they shall collect the greatest amount of traffic with the smallest amount of mileage; or, to say the same thing in other words, that the railway shall be made to accommodate as great an extent of country as possible, although some parts of the country may not be so well served by it as they would be by direct and independent lines. This consideration, everywhere important, has a peculiar reason, and peculiar facilities for its application, here. The great Syadree range, even at its most favourable point, will require unusual expense, both for the construction of the line on its slope, and for the current working of the traffic up and down it; and this extra risk and cost will require that every stream and rill of traffic which can be gained, should be turned to account in its favour. On the other hand, the advantage of railway transit, even in cheapness over every mode of conveyance at present in use in this country, will render it perfectly safe to adopt, for the railway, routes which are somewhat longer than those now used by bullocks and carts, if, indeed, the necessity for such longer routes should really be incurred by the endeavour to accommodate large districts with few lines. These considerations evidently point to a single line across the Concan and up the ghaut; and since the traffic of Bombay is derived from both northern and southern districts above the ghauts, it seems that the single line should take the most favourable engineering point in the ghauts to be found near the latitude at which it enters the Concan from the west. This view derives support from the fact that neither the Concan nor the country immediately east of the ghauts, is, at present, in a condition to contribute to the general traffic of the line, in proportion to the length of railway which will be located in it. The traffic will come *through* much more than *from* them, and they should therefore be traversed by the shortest possible length of railway.

7. Nor, is this all; a line of great internal traffic runs from north to south, and, *vice versa*, very nearly in the longitude where the trunk line above the ghauts would bifurcate to proceed north or south towards the districts supplying this traffic; these parts of the line, therefore, while they are indispensable to the coastward trade, will have a separate and important traffic of their own. If, for argument's sake, we suppose this north and south line in the interior to be already made, we shall see, at once, that the line to afford the greatest return to its proprietors, and the greatest advantage to the commerce of Bombay, would be one joining it at a right angle, as does the line now proposed.

8. These arguments are offered to show that, even if the Concan were a plain affording an unchecked choice of direction, and the Syadree range were a uniform smooth step, equally eligible for our purpose in every part, we must inevitably be led to the adoption of the lines now proposed; and when, in this very direction a route between Tannah and the Deccan is found more favourable, in an engineering point of view, to the construction of a railway, than any other known to us, a confident expectation is entertained that the Government will think the country has been sufficiently examined to warrant their definite approval of the line proposed. However certain the conclusions to be drawn from these facts may be, inquiries as to the engineering facilities of the districts to be passed through have not been neglected. Bearing in mind that a favourable ghaut (which it might be very laborious and difficult to find) would be useless, if it led only to an impracticable valley in the country above or below it (which it was much easier to learn), attention was rather directed to the country above and below the ghauts, than to the ghauts themselves. The results go far towards establishing the fact, that there is no other line nearly so good, merely in an engineering point of view, as that which is also shown as above to be preferable for other reasons.

* * * * *

I have the honour to remain,

Honourable Sir,

Your most obedient and humble Servant,

R. W. CRAWFORD,

Railway Office, Bombay,
6 June, 1846.

Chairman of the Provisional Committee in
Bombay, of the Great Indian Peninsula
Railway Company.

APPENDIX E.

REPORT of GEO. T. CLARK, ESQ., Engineer to the BOARD in BOMBAY of the GREAT INDIAN PENINSULA RAILWAY COMPANY, on the Engineering Features of the CONCAN and the GREAT WESTERN GHATS.

London, July, 1847.

GENTLEMEN,

The substance of the following report was drawn up in the district to which it relates, in the month of March last. I was on my way to examine the Koosoor Ghaut, the only remaining pass which I believe to be worth any further attention, when I received your instructions to proceed to England upon your affairs with as little delay as possible. This report is in consequence less complete than it would otherwise have been, and it has also necessarily been deferred until the present time.

I have the honour to be, Gentlemen,

Your obedient servant,

(Signed) GEO. T. CLARK.

London, July, 1847.

GENTLEMEN,

Your instructions of October last relate to three several works, two of which, the survey of the Alleh and Mhuse line, and that of the deviation line between Koobee and the Bervee, have been completed, and the results laid before you. I have employed the short time that remained after the completion of the latter survey, in a general examination of such parts of the Syadree range as were within my reach, and I now proceed to lay before you what I have to observe on that subject.

I have assumed that any line of railway professing as its main object the connection of the Peninsula of India with Bombay, must traverse the Syadree between the Bhore and Thul Ghauts. South of the Bhore Ghaut the high ground is for many miles perfectly impracticable. Considerably north of the Thul Ghaut, and between it and the Taptee River, the hills indeed sink down, and the ascent to the Deccan is reduced, I believe, to about 500 feet; but such a route would scarcely answer the ends of your railway,

and that considerable part of it which would, in such a case, pass up the Northern Konkun, would be circuitous and very expensive.

The country immediately north of the Thul Ghaut is shut out by a chain of heights, extending westward from the ghauts, and including the great mountain of Joona Mowlee. This high ground extends nearly to Vizerabye, and along the left bank of the Taunsa River. Judging from a general inspection of this ground, I am inclined to believe that any line passing northwards must turn the whole of it. The aspect of the valley of the upper Taunsa, as seen from Mowlee, is not inviting. The Scer Ghaut, about ten miles north of the Thul, is reported to be very easy of ascent, but I should much doubt whether the approach to it from below, by its valley, that of the Beyah, a tributary of the Vyturnee, would be found practicable. This is the ghaut by which it was at one time contemplated to carry, towards Calcutta, the post road which now traverses the Thul Ghaut.

The country immediately south of the Bhore Ghaut, like that north of the Thul, is cut off by a tract of high ground dividing the valley of the Apta from that of the Nagotna River, and extending west of the Punt Suchew's country. I have also taken a general view of this country from various points, and I am satisfied that it also is impracticable. This, therefore, is conclusive against the great ravine south of Khandalla, across the head of which the upper part of the Bhore Road is carried, and which is in some respects suitable for an inclined plane.

There remain, therefore, the Bhore and Thul Ghauts, and the country between them, a frontier of about 70 miles in length.

I have not ascended the Thul Ghaut, nor any of the passes between it and the Malsej, though I have visited the ground between it and Auja Purwut. I have, however, examined the lower parts of the valleys descending from this tract, as the Churnal, the Basta, the Shyee, and the lower Kaloo. The lower Kaloo is impracticable, and therefore excludes its tributary, the Shyee, and another smaller stream which descends from Dolekhum, and with them the 20 miles of frontier between the Malsej and the Chonda and Mandha Ghauts. In this district are situated the strong forts of Mudunghur, Allung, and Koorung, and Kulsabae Hill, reputed to be 5000 feet high, and the highest land in the Deccan. The Pimpree Bhore Ghaut, next north of these, is very lofty, and evidently out of the question.

The Basta is the river of the Thul Ghaut. I have ascended it from Callian to the junction of the Churnal. It affords so far a practicable, but by no means a straight or economical line. I ceased to follow it any higher, because, though suitable enough for a common road, it appeared to wind a good deal, and to be connected with numerous ravines on its northern side, unfitting it for railway purposes. It appears to me to be in a very high degree improbable that any practicable line into the Deccan should exist between Mowlee and the Thul Ghaut, and the Malsej.

Of the country above, below, and upon the range between the Malsej and Bhore Ghauts, I can, with the exception of one pass, speak from close personal examination. This country includes about 50 miles of the Syadree, and several passes, some but little known or frequented, and a few accessible only by means of ladders. With some limited exceptions, this line of ghauts, as far south at least as Beema Shunkur, presents one general and remarkable feature. It is not a mere scarp caused by the sudden cessation of the rise from the Deccan, and the occurrence of a precipice or steep descent towards the Konkun. These features are present, but in addition to them, upon or a little behind the scarp, there occurs a crest or ridge making a sort of boundary wall between the country above the scarp, and the scarp itself, and adding materially to the elevation of the latter as seen from below. At the Malsej and the Nana Ghauts this crest is imperfectly developed. Between and south of them it is from 800 to 1000 feet high at the least, and so perfectly precipitous on either side as to cut off completely all communication save where it is partially cleft by basaltic dykes. The head of the Murr Valley, immediately south of the Malsej, presents a well-marked example of this crest, as well as of the description of pass referred to, two of which occur, and are both ladders, rather than stairs, of stone, the steps being prisms of basalt.

This crest is wanting at the Nana Ghaut, the approach to the lower part of which is excellent; but the upper part is precipitous and impracticable, as is the valley above for some distance below Jooneer. South of the Nana the crest re-appears, and extends unbroken, or broken only by an occasional notch, as far as Seedghur, and thence increasing in breadth and height, to Beema Shunkur.

Below the Nana, and between it and Seedghur, occur the heads of the Heera, the Doyefodee, the Bervee, and the Mogree Rivers, the latter

rising on both sides of the promontory of Seedghur. The course of each of these rivers is marked by a spacious plain, extending, very nearly level, to within a couple of miles, and often much less, of the foot of the ghauts, and probably nowhere above from 150 to 200 feet above the level of the sea.

The Heera and Doyefodee are practicable by means of the Bervee, though their natural outlet is by the Kaloo. The lower part of the Mogree reaches the Bervee through the Chone jungles, and is impracticable.

The excellence of the Heera and Doyefodee valleys, though turned to account in my amended line (of 1846-7) to the Malsej, is of little value as regards their proper ghauts, which, from the Nana to Seedghur, rise as a precipitous wall of rock, crossed by no pass practicable for bullocks, and much above 3000 feet high, of which the upper 600 or 800 feet would be, as already described, ascended on one side, only to be descended on the other, unless obviated by a tunnel of unusual length, and which could be excavated only from the two ends. These ghauts are in fact quite impracticable. From the fort of Seedghur a spur of high ground extends three or four miles into the plain. This affords an excellent and easy ascent to the platform upon which rests the great pyramidal mass of Seedghur. But this platform, though high, is 1000 feet below the main crest of the ghaut, which rises a little distance behind it, and cuts off all hope of an ascent in this quarter. It is the occurrence of this precipice which renders the Kopolee Ghaut so difficult, and made the hill fort of Seedghur, like that of Bhyrogurh, absolutely unassailable from the Deccan.

From Seedghur to Beema Shunkur the range rises in elevation and retains its precipitous character. Beema Shunkur gives off a spur which passes south-westward into the Konkun, some eight or ten miles, and affords a good approach to its lower platform, and to the lofty detached rock, known as Kulwuntée chá Mahal. Behind this, as at Seedghur, the main crest rises abruptly; so abruptly that the foot-path is carried along the platform full two miles on a level, and the bullock road thro' it, before any further ascent can be attained. The foot road then ascends by short traverses of six to twelve feet long, with occasional steps cut in the rock, and thus a second platform is reached, and the foot of a higher precipice, to turn which the road once more passes on a level for some distance before its final ascent becomes practicable.

Beema Shunkur combines all the worst features of a ghaut as regards the purposes of a railway. The elevation of the Deccan behind it is very considerable, and the level of the Konkun before it is remarkably low. The scarp is therefore lofty, and it is also precipitous; and the crest superadded to its summit is broad and lofty, as may be well seen in the deep valleys by which it is scarred, and which contain the sources of the Beema. I have dwelt upon the features of this ghaut because they are in a greater or less degree those of all the range for sixteen miles on its north, and seven or eight on its south, or between the sources of the Meena and the Baum Rivers, which include a tract of high ground extending nearly to the Yeil River, and for railway purposes quite impracticable.

South of Beema Shunkur, the general line of the Syadree lies north-east and south-west, and a number of spurs, corresponding to the ridges passing south-eastward into the Deccan, pass north-westward into the Konkun. These are all accessible from Kallian by the broad and level valley of the Oolassa. The ghauts near to Beema Shunkur and Kotleegurh are high, and the ground behind them is bad. Further south, however, the ridge slightly sinks, and, at the Koosoor Ghaut, an easy valley below is combined with a tolerably level one above, and the ghaut admits of the formation of an inclined plane by means of its spur.

It is also to be observed that the Koosoor Ghaut is accessible only from the Oolassa River, and therefore can only be reached from Bombay by way of Tannah and the country north of the Bhow Mulling and Towlee range, which extends nearly to Kallian. But the Koosoor Ghaut lies nearly in the latitude of Bombay fort, and about twenty miles south of that of Tannah or Kallian; a circuit which, disadvantageous if the question were one of communication with Poona or the south, quite unfits it for any trunk for the northern traffic, which would have first to ascend twenty miles to Tannah, and then to descend the same distance to Koosoor, whence it must pass at least twenty miles still further south before it could turn the high ground about the junction of the Inderaonee with the Beema. The valley above, that of the Under, falls into the Inderaonee a little above Eendooree and Tullehgaom Dhabaray. At Tullehgaom this river is not above two miles distant from the Powna, one of the rivers of Poona; but these streams wind in very deep rocky beds, through a country the surface of which undulates seriously; and a railway carried either by Powna to Poonah, or by the

Inderaonee and Beema towards the east, would probably be of expensive construction, and with bad gradients. If no other pass across the ghauts existed, this no doubt would be recommended as perfectly practicable, but it is in no respect comparable to the line already surveyed.

The country between the Koosoor and the Bhore Ghaut, and about the latter, is high and broken. The ravine north of the Bhore Ghaut, at the head of which stands the village of Khandalla, is no doubt perfectly accessible from Kallian by the Oolassa, though not from Panwell; but the ground above, a part of which is traversed by the present road, is for six or seven miles, almost, if not quite, impracticable. This is the final objection to the various ravines which cluster round the line of the Bhore Ghaut road.

It appears, therefore, that between the Malsej and the Bhore Ghaut there occurs one ghaut only which can be regarded as practicable for an ascent by an inclined plane; and to reach that one from Bombay a considerable circuit must be made, and to extend a line from it far inward an unfavourable country must be crossed.

Of the ghauts to the north of the Malsej I can speak with much less confidence, though I do not think any one of them will be found to suit the purposes of the railway.

In conclusion I may add a few words concerning the ghaut which has been selected.

It will be seen by reference to the maps of the presidency, that from Auja Purwut, Hurreechunder, and the space between them, parts of three distinct systems of rivers take their rise. The Mool and the Prewura (or Pera), southern tributaries to the Godavery, rise upon the northern and eastern flanks of Hurreechunder, and from thence northwards to Auja Purwut and Ruttunghur. The Kristnawunttee, a northern tributary to the Kokree, and thus through the Gour and the Beema, to the Kristna, rises on the southern flank of Hurreechunder, and above the Malsej Ghaut. Westward, the Kaloo rises, by numerous sources, from the western flanks of the same mountains, and pours its waters into the Basta, or river of Kallian.

For these reasons it would probably be thought, *a priori*, that the Malsej was one of the higher points of the Syadree range, and therefore the best suited for the transit of a great trunk line of railway. This is no doubt true of the range between Auja Purwut and Hurreechunder, the extreme points of which rise to 4600 feet above

the sea ; but it does not apply to the Malsej itself, which rises only to 2950, and is therefore much lower than the adjacent mountain of Hurreechunder.

The reason of this is sufficiently evident. In the first place, the valley of the Malsej is much broader at its commencement than any other of the ghaut valleys, and is therefore less encroached upon by the high mountain ridges on either side, which in fact do encroach upon and render impracticable the narrower valleys north of Hurreechunder, and those south between the Malsej and Nana Ghauts. Secondly, the natural position of the crest of the Malsej would be in a line between Auja Purwut and Joodhun ; but by some natural operation, shown by the presence of numerous fissures and basaltic dykes, the whole of the crest between these mountains has been removed, and, by the excavation of a vast bay, thrown about six miles eastward, where, of course, its level was lower, by the fall due to that distance, which, to judge from the adjacent valleys, must have been very considerable. Also the floor of the bay has not been excavated to the general level of the Konkun ; so that in addition to the depression of the crest, the base is unusually elevated, and hence the actual elevation of the crest of this ghaut above the valley immediately below is only 1700 or 1800 feet, instead of between 3000 and 4600, as in the adjacent cases. The fact is, that instead of being among the higher, the Malsej is among the lower, points of the range, measured from the sea ; and, measured from the valley beneath, is no doubt the very lowest.

The position of this ghaut in the bottom of a bay, one side of which runs out for eight or ten miles nearly east and west, offers another contingent and almost equal advantage, since it affords a regular and easy ascent for the line of railway from the plain to the summit ; and the spurs, which in an ordinary case might have been expected to render such an ascent along eight miles of mountain side impracticable, have been materially reduced by dykes of basalt, by which some have been cleft away and removed, and others much reduced in breadth, so that only one, Sindloo, presents any serious obstacle.

In the Malsej Ghaut, therefore, the following advantages are combined.

It is in the direct line between Bombay and Calcutta. It is lower in elevation above the sea as compared with other ghauts ; it is, I believe, much the lowest ghaut in its elevation above its proper

valley in the Konkun.⁶ It is accessible either by a straight plane of one in fifteen and one in eighteen, or by a moderately curved one of one in forty. The valley above it admits of gradients not exceeding sixteen feet per mile, at least as low as Mhusu, and of a practicable line at least as low as Sholapore. It admits also, I learn from Mr. Chapman, of being carried by unobjectionable planes into the valleys of the Godavery and other northern rivers. I am not aware of any lower ghaut. A ghaut accessible by so easy, inexpensive, and direct an approach from below I am very sure does not exist. I much doubt whether any other valley in the Deccan will allow of 75 or 80 miles of easy gradients, such as the surveys now before you prove to exist here. A better line across the Konkun may possibly be found, but none nearly so direct; and for the combination of all these advantages I believe you might seek elsewhere in vain. The Malsej Ghaut was not proposed to you by me. Indeed, from the great breadth of the Konkun, and from other causes, it is nearly the last place in which I should have sought a line. It was recommended to me with the first instructions I received from your Managing Director, Mr. Chapman; and after an examination of the country for two seasons, I may be permitted to add that the selection does him infinite credit.

I remain, &c.,

GEO. T. CLARK.

APPENDIX F.

ON THE TRAVELLING EXPENSES OF THE NATIVES OF WESTERN INDIA.

The passenger traffic of Western India, although excluded from present estimates and discussions for its uncertainty, will become in time a matter of considerable practical importance. It is difficult to form general conclusions from any information at present possessed, of the travelling habits and expenses of the natives. The following cases of different classes, are selected from 140, collected in Bombay, the details being mostly taken from the private cash accounts or other statements of the travellers themselves. They were obtained under the superintendence of Maunsingh Bhowaneysingh, my chief native assistant, on whose accuracy, judgment, and fidelity, I had every reason to rely.

1. A very wealthy Bramin inhabitant of Bombay, who frequently goes from that place to Poonah, commonly spends about 26*l.* on the journey, which occupies five days; he takes fifteen horses, fifteen baggage carts, and twelve palanquin bearers. His household establishment appears to consist of at least 77 persons, most, if not all, of whom accompany him.

2. The widow of a native hereditary territorial officer of high rank (the Dessaye of Gokak, in the South Mahratta country) went a journey of 66 miles, in three days with ten horses, eight ponies, fifteen sepoy, ten hammals (bearers or porters), and fifteen car-koons (clerks, or men of business); expense, 73 rupees, 15 annas, 6 pies, equal to 7*l.* 0*s.* 9*d.*, or 2*s.* 1½*d.* per mile.

3. A chief native officer of the Supreme Court of Bombay supplied particulars of 26 journeys on public business, of which three are the following:—

“After a few days stay there” (at Honawur, on the coast), “he proceeded towards Sirsec, a distance of eighteen coss” (less than 40 miles), “and spent three days on the road. The expense incurred to him is as follows:—

	R.	A.	P.
“Hire for six bearers, at 1½ anna each per coss (1½ <i>d.</i> per mile) . . .	10	2	0
“Paid for carrying the luggage, twelve biggaries” (labourers) ½ anna each per coss” (½ <i>d.</i> per mile)	6	12	0
“Mess expense for three days	3	0	0
“His people or servants, walking all the way through, as far as Sir-see, over a hilly country, got their feet sore, and he allowed oil of one-quarter of an anna every day to each of the seven men for three days	0	5	3
“Fuel for making hot water to wash their feet with	0	1	6
“The servants and the men employed in carrying the luggage being tired of ascending the ghaut, liquor allowed to refresh them . . .	0	11	0
“Torch-bearer’s wages, at 4 rupees per month	0	6	5
“Two servants’ do., at 3 rupees and 5 rupees each	0	12	9
“Two Bramin cooks do., at 3 rupees and 5 rupees each	0	11	2
	22	14	1

Equal to about 2*l.* 3*s.* 6*d.*, or 13*d.* per mile.

“After staying there” (at Haweree) “some time, he arrived at Hooblee,” (a large commercial town,) “a distance of fifteen coss,” (38½ miles,) “spending two days on the road; expended as follows:—

	R.	A.	P.
" Feeding horse lent by a friend for the use of the Bramin cooks	0	6	0
" For returning it to its owner	0	10	* 0
" One hired tattoo" (pony)	2	0	0
" Two hired bullocks for carrying luggage, 1½ rupee each	3	8	0
" Four bullocks of a cart lent by a friend for a distance of four coss, as far as Sawnoor, and the hire of a biggery" (labourer) " that drove the cart	0	14	0
" Feeding and returning a horse to its owner, who had lent it for riding to Hooblee, and the hire of the man that carried it	1	2	0
" Mess expense for two days	2	8	0
" Torch-bearer's wages	0	4	3
" Two servants	0	8	6
" Two Bramin cooks	0	7	5
	12	4	2

Equal to 1*l.* 3*s.* 6*d.*, or about 7½*d.* per mile.

" After staying at Ahmednuggur he returned to Poonah within five days, distance 36 coss," (74 miles,) " and the expenses incurred to him are as follows :—

	R.	A.	P.
" To feeding his own horse, at 6 annas per day	1	14	0
" Five tattoos" (ponies) " hired	17	8	0
" Mess expense	2	13	0
" Ramoosees for watching" (men of a particular caste so employed, where a traveller rests at night)	0	5	0
" Ghorewalla" (horsekeeper), " at 4½ rupees per month	0	12	0
" One servant at 3 rupees	0	8	0
" Two Bramin cooks, at 3 rupees and 3½ rupees per month each	1	1	4
	24	13	4

Equal to 2*l.* 6*s.* 8*d.*, or about 7½*d.* per mile.

Many of the journeys of this officer average 1*s.* 4*d.* per mile.

4. A tradesman of Jooneer went with his wife to Sattara, in six days; distance 114 miles; expenses as follows :—

	R.	A.	P.
" Two tattoos for Poonah	2	8	0
" Two ditto to Sattara	5	0	0
" Two hammals" (porters) " to carry a child in a cradle	6	0	0
" One cook's wages, at 4 rupees per month	0	12	9
" One servant's ditto, at 3 rupees per month	0	9	6
" Messing	3	0	0
" Sundries	0	8	0
	18	6	3

Equal to 1*l.* 15*s.* 3*d.*, or, for the whole party, 3½*d.* per mile.

5. A native of the South Mahratta country went from Dharwar to Bombay, accompanied by a Bramin servant, at the following expense; distance 339 miles:—

	R.	A.	P.
"Two tattoos to Panwell, fifteen days, at 10½ rupees each"	21	0	0
"Feeding and sundries"	7	8	0
"Rent for places on the road" (to sleep in at night)	1	14	0
"Ramoosees, for watching"	0	7	6
"Toll at the Bhere Ghaut for tattoos"	0	2	0
"Boat hire for crossing the Kristna and other streams"	1	0	0
"Carriage of baggage from the village of Panwell to the bunder" (wharf)	0	2	0
"Freight of boat" (fare to Bombay)	1	0	0
"Carrying out things from the boat to the shore"	0	1	0
"Ditto from thence to the house"	0	2	0
	33	4	6

Equal to 3*l.* 3*s.* 9*d.*, or about 2½*d.* per mile.

6. An astrologer travelled from Bombay to Jooneer in seven days for 17 rupees 2 annas and 3 pies, including the expense of the Bramin who assisted him, and 1½ rupee, the charge of crossing seven rivers between Bombay and Jooneer. The distance by the way of Poona is 121 miles, on which the total cost of 1*l.* 12*s.* 10*d.* comes to 3½*d.* per mile.

7. A native inspector of Government vernacular schools, in the South Mahratta country, went several journeys, of which one may be noted, viz., from Dharwar to Poona, in twelve days, distance 268 miles; cost for himself and his Bramin servant, two ponies, watchman, and sleeping places, 25 rupees 12 annas, or 2*l.* 9*s.* 4*d.*, being about 2½*d.* per mile¹.

¹ I avail myself of this late and somewhat irregular opportunity to state a few facts connected with education. Willingly waiving discussion as to the connection of Governments with education, in respect of which I am probably much in the minority, I cannot revert without great pleasure to the visit I made to the Government school at Ootoor, a town of about 7000 inhabitants, 12 miles eastward from the Malsej Ghaut. The native local authorities invited me to see their town; after showing me its different quarters, and some improvements in paving, &c., which they had effected by local rates, without the intervention of the Government, they led me to the school, kept in the chamber over the gateway of the decaying fort or citadel, which occupies a corner of the town walls. The room was filled with inhabitants, and with the children, the latter forming three classes. The teacher had been

8. A bapian inhabitant of Bombay went on pilgrimage to Punderpoor, accompanied by his wife, mother, son, cooking Bramin, four servants, and seven banian beggars. The journey occupied 14 days; the distance is 191 miles from Panwell. The party seems to have travelled in two bullock carriages, hired for the journey at 24 rupees, and a doolie, an inferior kind of palkey, with six bearers, at a cost of 50 rupees. The whole expense of the journey, including the food of the mendicants, was 154 rupees 12 annas, or 14*l.* 16*s.* 7½*d.*, equal to 1*s.* 8½*d.* per mile, for the whole party of sixteen persons, or 1¼*d.* per mile for each of them.

9. Four inhabitants of Bombay went from that place to Punderbrought up in one of the central Government schools at Poonah. An examination was entered on, which was conducted by my native assistant, who was educated in the same school as the teacher, and who spoke English well. The first class read, in their own language, a chapter of Grant Duff's History of the Mahrattas, stood well an examination in parsing, and solved very quickly a question which required, with other operations, an extraction of the square root; they pointed out my route back to England on large educational maps of the world, in Mahrattée, which hung on the walls; they had commenced logarithms, with the view, I was told, of proceeding to trigonometry. The second and third classes acquitted themselves with equal credit, in tasks suited to their lower standing. Schools like this, I afterwards found, were established in most or all of the considerable villages or market towns of the district; and certificates of proficiency, signed by Mr. Eisdale, then at the head of the system, were often presented to me with applications for employment.

The large educational establishments of Bombay require brief mention. The Elphinstone Institution, founded chiefly by funds subscribed by natives, in memory of the benefits derived from the public course of the distinguished Indian statesman whose name it bears, contains 1500 students, of all castes and creeds, and of all ages, from infancy upwards. Classes for the highest branches of literature and science exist here, as well as others for the most rudimentary teaching. Another institution of similar magnitude and character is under the care of the missionaries of the Scottish Free Church. The Grant Medical College, and other establishments, are devoted to special objects. All these are, I believe, doing, on the whole, good service; but, if I am rightly informed, the great share taken (perhaps here unavoidably), by the Government in the management of the Elphinstone Institution, is not without some degree of the disadvantages which follow such management in other cases.

Some private persons maintain small schools for native children; and some of the natives, who have been educated under British influence, have latterly set up voluntary institutions for (I think gratuitous) female education. A merchant of Ahmedabad, in Guzerat, has just established a school for native females in that city, for which, as appears by the Bombay newspapers, of November 2, the Government has bestowed on him the native title of "Rao Bahadoor."

poor, probably on pilgrimage, and were eleven days on the road. They went by boat to Panwell, thence by cart to Poonah, and thence on ponies to Punderpoor. The expense to each person was 8 rupees 14 annas, or 17s., equal on the distance of 191 miles from Panwell to little more than 1d. per mile.

10. A dealer of Jooneer went to Nagpoor to purchase cotton cloths, apparently with one hired pony and one Bramin servant; the time and distance both ways were 45 days and 1000 miles; his expenses for going and returning were 41 rupees 11 annas and 9 pies, equal to 47s., or not quite 1d. per mile.

11. The following may serve to show the manner in which the difficulties of personal travelling are sometimes met; the journey was that of a clerk employed in Bombay, who went to that place from Islampoor, distance from Panwell 186 miles.

	R.	A.	P.
" He had his own tattoo and groom, and on the first day came to Oomruj, where he met with a friend who fed him and his tattoo; so the charge is omitted here			—
" Left Oomruj for Sattara, where he spent for tattoo	0	3	6
" Brought some catables from home, which he eat at Sattara			—
" Next at Kowtch, horse	0	3	3
" At Khapoorwhal, horse, groom, ramoosee, and self	0	4	3
" Here he met with a friend going to Poonah, who supplied him and his tattoo with provisions, at his own expense, as far as Poonah.			—
" Left Poonah for Wurgaom, horse, ramoosee, and self	0	2	6
" At Khapoollee, ditto " (at the foot of the Bhore Ghaut)	0	3	6
" At Panwell, ditto	0	3	9
" Sent back the tattoo and groom, and paid for their provision, 10 annas, for tattoo and groom, 2 rupees 2 annas, which is his pay for sixteen days, at 4 rupees a month, for going and coming	2	12	0
" Boat hire from Panwell	0	8	0
" Carriage of baggage to the dwelling house	0	1	9
	4	10	6

Equal to 8s. 10½d., or not quite one-tenth of 1d. per mile; the time is, apparently seven or eight days.

12. A Bramin priest of Bombay travelled from that place to Sattara in seven days. By hiring a bullock carriage to Poonah along with two other persons, for 4½ rupees, and another from Poonah to Sattara, with three others, for 5 rupees, he brought his own total expenses, including food, fees to ramoosees, &c., to 3 rupees 13 annas,

or 7s. $3\frac{1}{2}d.$, being, on the distance of 135 miles, at the rate of a little more than six-tenths of 1*d.* per mile.

13. Three Goozerattee mendicant Bramins, who were obtaining alms to the amount of about 5 rupees per month each in Candeish, travelled from Dhoolia to Bombay in 27 days, apparently on foot. Their joint expenses, which, besides food, included little more than ferries, came to 13 $\frac{1}{2}$ rupees, or 1*l.* 5s. 10 $\frac{1}{2}d.$ The distance is 213 $\frac{1}{2}$ miles, and the cost of the journey was, therefore, nearly $\frac{1}{2}d.$ per mile for each person. At Bombay they realized 10 rupees per month each by their profession of religious mendicancy, and after a time one of them set up a native school, by which he raised his income to 15 rupees.

14. The patell of Hewra, near Alleh, came on foot to Bombay in four days, distance 100 miles, cost 13 annas, or about 1s. 7*d.*, being equal to about one-fifth of 1*d.* per mile.

15. A shepherd, a native of Islampoor, goes from Bombay to that place in seven days, spending on the road 14 annas, or about 1s. 8*d.* The distance is 186 miles from Panwell, and the cost therefore is about one-tenth of 1*d.* per mile. "He tells that he is in the habit of frequenting to and from Bombay, once in a year or two, to earn his maintenance, and as soon as he obtained it sufficient to last for a small period, he leaves Bombay for his village. It is usual with this man, that when he sets out for Bombay he takes with him, from his home, a little quantity of bread, sufficient for two days, and a little quantity of flour, that can serve him for three or four days more, and after it is over spends for his eating about 1 or 1 $\frac{1}{2}$ annas" (1 $\frac{1}{2}d.$ or 2 $\frac{3}{4}d.$) "a day until he reaches Bombay."

It is not professed that these instances are sufficient for a full discussion of this curious and important subject; they are selected merely to give some insight into the costs and incidents of native travelling in Western India.

NOTES ON THE MAPS.

MAP OF INDIA.

THE quadrangle figure whose angles are at Bombay, Ougein, Kyragur, and Kurnool defines approximatively the country supplied with salt from the coast near Bombay (p. 316;) and also the part of India with which Bombay communicates commercially through the neighbouring ports of the Concan (p. 164).

The quadrangular figure, whose angles are near the words Malligaon, Deoghur, Sirsee, and Puttykonda, shows roughly the country which has supplied cotton largely to the rest of India, which sends cotton now to Bombay, and from which sufficient supplies are most likely to be obtained. Pages 46, &c.

The railway line which passes from Bombay by Callian, the Malsej Ghaut, Alleh, and Chaleesgaon, is that which was proposed for the Great Indian Peninsula Railway: it has a line from Alleh to Sholapoor.

The railway line which passes from Bombay by the Bhore Ghaut to Poonah, and thence by Ahmednuggur and Aurungabad to Ajunta, is that proposed by Lieut.-Col. Grant.

MAP OF SOUTH AMERICA, MEXICO, AND WEST INDIES.

The only remark required by this map is that the straight line in Brazil, from the Parana River, in lat. 26° S. to the coast in lat. 3° S., is neither a natural nor a political division, but an imaginary line, between which and the ocean, much the greater part of the population of Brazil is situated. Pages 160, &c.

MAP OF WESTERN INDIA,

AS TRAVERSED BY THE PROPOSED RAILWAYS.

(Compiled from maps constructed under the authority of the Government of Bombay.
Scale 10 miles on 1 inch.)

The railway line proposed and surveyed for the Great Indian Peninsula Railway Company passes from Bombay by Tannah, Moorbar, Nudvee, Kholetun, and Morsee, to the Malsej Ghaut: the alternative line, which is deemed preferable,

inasmuch as it admits the use of locomotive power for the ascent, passes from Nudvee by Tuflowlee to the Malsej Ghaut. From the last-mentioned point the line is easily traced on the map to Alleh, and thence northward by Gunj peer, and through the Gunguthurree to Unkaee Tunkaee, and so by Chaleesgaon;—southward by Seroor, Mhuse, &c.

The railway line or lines proposed by Lieut.-Colonel Grant, from Inora Bunder and Tannah to Poonah by way of the Bhore Ghaut, and thence by Ahmednuggur and Aurungabad to the Ajunta Ghaut, are laid down, with such details as the slight information afforded, and the known features of the country seem to suggest. Besides the lines from Inora Bunder and Tannah to the Bhore Ghaut, another line has been shown along the valley of the Oolassa River, in the belief that this is the most eligible, perhaps the only practicable, railway route from the Bhore Ghaut to Tannah.

The line from Kusseylec Bunder, by Shawpoor, the Thul Ghaut, Nassick, and Chandore, is that now traversed by the north-eastern traffic. Previous to the first improvement of the Thul Ghaut, about 1826, the principal Beinjarree route was by Boputgurh and Trimbuck. No railway line has been laid down on the map in this direction, from the impossibility of judging, if practicable at all, what course it would take.

